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Original Articles.

ON THE VACCINAL PROPERTIES OF PATHOGENIC MICROBES DEPRIVED OF VIRULENCE BY CULTIVATION.[1]

BY M. A. CHAUVEAU.
PARIS, FRANCE.

[Concluded from page 345.]

(E) Restoration of Virulence in the Cultures of "Anthrax Bacillus," of which they have been Completely Deprived.

TO restore all of its activity to the decreased activity of anthrax bacilli is easy, as M. Pasteur has so well demonstrated, even when the decrease was carried very near to the limits that separate simple attenuation from complete loss of virulence. It is enough for this, that the attenuated culture should be able to kill subjects belonging to the categories particularly susceptible to anthrax, as guinea-pigs a day old, and mice. After passing the virus a certain number of times through these animals, then through others less sensitive, we surely succeed in reconstructing a virus that kills sheep and rabbits just as well as the bacillus that has not gone through a phase of attenuation. But when it concerns cultures having become incapable of manifesting their virulence when inoculated in animals, whatever they may be, how shall we assure ourselves that this lost virulence is nevertheless not destroyed virulence, and that we are able to restore to it its power?

My attempts to solve the problem do not date from to-day, because a long time since I found that anthrax bacilli, while vegetating quite well in culture bouillons, lost all power to infect the species of animals most apt to contract the disease from inoculation. I had uselessly tried the virulent revivification of cultures which had become inactive by accident, that is to say, under undetermined conditions, and especially, of such as can be regularly obtained, by allowing the first Pasteur vaccine to age, to a slight degree, or any other anthrax vaccine obtained, like the latter, by the intervention of a dysgenesic temperature.

I have returned lately to my cultures of bacillus anthracis deprived of all virulence by the intervention of compressed oxygen. It would be useless to recount all my experiments in detail; but it may be of advantage to make known the principles that have guided me.

To begin with, it was absolutely necessary to renounce, in restoring virulence to cultures of the anthrax miscrobe, the employment of passage inoculations in subjects particularly apt to contract anthrax. The question may at first appear singular. I will explain at once.

These indifferent bacilli are incapable of communicating anthrax, to any subject whatever, under the usual conditions of inoculation, it is true; but it is not demonstrated that they would not succeed with some modification of the conditions; for example, the employment of a large quantity of material in making the inoculation, that is to say, the intervention of a large number of infecting agents. Theoretically, this is possible. Practically, I have not reached that result. But I cannot conclude that it is not possible

[1] Translated for THE TIMES AND REGISTER by a non-medical friend.

to obtain it. My experiments have not been numerous, and I have not dared to go beyond the dose of three drops of culture bouillon in my inoculations of young mice, a dose already enormous if it is compared to the volume and weight of the animal.

While temporarily abandoning this course, I do not, therefore, renounce it altogether.[1]

But to sum up, it was necessary for me to discontinue the employment of special methods of culture, *in vitro*, in order to attain the revivification sought. What are those indicated by the conclusions drawn from facts previously known?

It has been established (A. Rodet) that bouillons poor in nutritive materials favor, much better than those that are too rich, an excellent morphological development of bacillus anthracis, and that the culture quickly ends in the formation of beautiful spores, in these impoverished nutritive media. Perhaps this poverty is itself also a favorable condition to the development of virulence, and that we may be able by applying this condition to restore the infectious property in cultures from which it had disappeared.

2. If the intervention of compressed oxygen in cultures of bacillus anthracis, at first weakens the virulence and afterwards causes it to disappear, is it not logical to demand the restoration of this virulence in cultures made under precisely inverse conditions, that is, under pressure of considerably diminished oxygen?

3. Among the conditions which influence the morphological development of the virulence of bacillus anthracis, it is necessary to cite the *nature* of the nutritive materials of the bouillon of the culture. M. A. Rodet, already cited above, speaks "of a trial culture . . . made with a few drops of blood of a guinea-pig, that died of anthrax, in distilled water, which rapidly produced spores abundant enough and *remarkably active*." In this experiment, made under my eyes in my laboratory, the liquid of the culture was not only poor in nutritive material, but it had a special composition generally unused. Now, ever since, I have frequently observed that the addition of a very small quantity of fresh blood to a lean bouillon renders it particularly proper to produce *very virulent* spores of *bacillus anthracis*. Thence, a new indication for the reviving of the virulence of my races of bacilli that had become indifferent.

Let us rapidly review the attempts made by the intervention of these three orders of conditions.

(a) *Attempt at Restoring Virulence to Bacillus Anthracis by Changes of Nutritive Richness in the Culture Bouillons.*—A word, first, concerning the normal bouillon that I habitually employ in my attenuated cultures of bacillus anthracis.

This bouillon is made with:

Distilled water	1000	grammes.
Veal (freed of fat, cut in small pieces, and chopped fine)	200	"
Sea salt	10	"
Neutral phosphate of soda	2	"

The vessel containing the water and the meat is placed over a gas oven, of which the temperature is slowly augmented in such a manner that the liquid will require about an hour to reach the boiling point. It is held there during twenty minutes, and then withdrawn from the fire, after the sea salt and the phosphate of soda have been added. After cooling, it is filtered, and enough distilled water is added to make one litre of bouillon. It is then neutralized, if it is necessary, by adding small pieces of caustic soda.

This bouillon is then sterilized in the autoclave.

It must never be used stronger; but dilutions of this bouillon, more or less extended, can be advantageously used. Those that I have most commonly employed are the following: one-half, one-fourth, one-eighth.

These diluted bouillons lend themselves very well to all the cultures of bacillus anthracis, virulent or attenuated. Still cultures totally deprived of virulence give, at times, in bouillon diluted to one-eighth, only very poor development. This rarely occurred to me with my race B, but oftener with my race A. Nevertheless, in all cases sporulation took place quickly and well.

By reason of this indication of greater interference suffered by the race A, I chose it in my trials at revivifying the virulence.

Third Experiment (*multiple*).—I inoculated, by way of comparison, either new-born guinea-pigs or, oftener, young mice, with cultures made in bouillon, $\frac{1}{1}$, $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$. In neither case did I succeed in giving anthrax to the experiment animals. It is true that the cultures in diluted bouillon had not yet passed the fourth generation.

Perhaps other results will be obtained after a greater number of generations. At all events, it will be seen, further on, that care must be taken to see, in the negative results of the present experiments, the proof that the greater or less richness of the bouillon has influence in the reconstruction of lost virulence.

(*b*) *Trial at Restoring Virulence to Bacillus Anthracis in the Presence of very Rarified Oxygen.—Fourth Experiment.*—I made but one experiment in the bouillon $\frac{1}{1}$, sown with beautiful spores from a culture in bouillon of $\frac{1}{8}$, third generation.

The bouillon $\frac{1}{1}$ was introduced already sown in a Pasteur tube, in which the air was rarified, the tension being brought very near vacuum. Perhaps it was carried too far, as the result was a culture of rare poverty. Yet there was evident proliferation. Under the microscope, liquid withdrawn from the tube after seven hours showed little masses of deformed mycelium with irregular spores. There are also liberated spores, appearing smaller than the normal spores—some very refractive, others more dull.

The inoculation of the liquid was made in doses of two drops in a guinea-pig six days old; and in a dose of one drop in two mice. The three subjects did not contract anthrax, and continued to enjoy good health.

[1] It happened to me, in my experiments, to kill two young mice—very quickly—with the culture B, which I regard as being, certainly, more weakened than the culture A. Is it he poison of the *bouillon* of the culture that caused the animal to die? The spleen was certainly destitute of the infectious microbe. Unfortunately it was not sought in the ganglia, near the point of inoculation, where it could have localized itself.

This experiment was unique. It will be understood by what follows, which was not repeated, and which, it must be said, still with reference to this experiment, that the negative results should not be interpreted as a proof of the impotence of the vacuum, relative to the restoring of virulence.

(*c*) *Trial at Restoring Virulence to Bacillus Anthracis by the Addition of Blood to the Culture Bouillons.—Fifth Experiment.*—I took a small flask containing the bouillon ½, and I added a large drop of fresh blood, from a guinea-pig just killed. Then I sowed the bouillon with a droplet of the same culture in the bouillon ⅛ that was used in the two preceding series of experiments.

There resulted a rich bacillic proliferation.

The new culture was inoculated on two mice and two adult guinea-pigs.

Curious results: The two mice resisted, and continued in good health, as well as one of the guinea-pigs; but the other guinea-pig contracted a voluminous œdema at the inoculated region (the right thigh), and died tardily of anthrax (five days after the inoculation).

Evidently, if things had occurred regularly, it is the mice that would have shown themselves the most sensitive to the action of the inoculation. The death of one of the guinea-pigs is a sort of irregularity which does not permit that all of the value the experiment may have should be attributed to it. Nevertheless, the result obtained in this experiment should not be deprived of all its significance. One thing is evident, which is, that virulence can be restored to anthrax bacilli that have been deprived of it.

(*d*) *The Influence of Blood Added to Cultural Bouillons, Combined with the Influence of a Relative Vacuum in Restoring Virulence to Inert Cultures of Bacillus Anthracis.*—Since, in the present experiments, it is in the last series that the only case of anthrax infection that supervened, was observed, we are authorized to consider the addition of blood to the culture bouillons as the principal condition which must be made to intervene to bring about the restitution of virulence to bacillus anthracis. Let us, then, continue this condition with those which have already been studied, in order to see what will result from the combination.

At first, let us observe what takes place when we add the effect of the relative vacuum to the notable influence that the addition of blood seems to exercise on culture liquids.

Sixth Experiment.—The experiment was made comparatively with the preceding, and employing the same materials.

Thus, as soon as the small flask in the last experiment was sown, a small quantity of the sanguineous bouillon that it contained was introduced to a Pasteur tube. Immediately after, the air was extracted from the latter by means of a mercury pump, very near to a perfect vacuum. Then the tube was sealed and placed in a moist-chamber at 32°. At the end of a few hours, the development appeared absolutely terminated. We awaited the expiration of the eighth day to open the tube and extract the liquid from it. This, examined under the microscope, appears poor in anthrax microbes, especially when it is compared with the identical liquid in which the culture was made in contact with air. There are found in the first—that which was exposed to the action of rarified air—only mycelia broken up into short rods, with a few spores.

Two mice and two guinea-pigs—one eight days, the other two days old—were inoculated with this liquid (one drop).

Of the two guinea-pigs, the younger died between the tenth and eleventh day after the inoculation. But anthrax did not cause the death; in fact, no trace of the bacillus is found, either in the blood or in the spleen, besides sowings, and inoculations with these materials remain sterile.

The other guinea-pig retained its health.

As to the mice, both died of typical anthrax during the third day following the inoculation, that is, after the forty-eighth and before the sixtieth hour.

This time, the success should not be contested. It is perfectly regular. We have succeeded in rendering infectious to mice, bacilli of the race A. It is equivalent to saying that the virulence of this race A is rebuilt. There is not room for doubt, in fact, that with a series of passages, as well through mice as through guinea-pigs, activity will be imparted to the virulence, proper to causing the death of the sheep, the rabbit, or even the horse.

(*e*) *Influence of Blood Added to Culture Bouillons, Combined with that of a Feeble Concentration of these Bouillons on the Restitution of Virulence to Inert Cultures of Bacillus Anthracis.*—The success obtained in the last experiment, in adding the auxiliary influence of an imperfect anærobic to that of a specially favorable nutritive material, makes me hope for good results from the combination of the effects of a special composition of culture bouillon with those of a feeble concentration of this bouillon. Let us see these results.

Seventh Experiment.—A small flask was stocked with bouillon diluted to ⅛, reinforced by a drop of fresh blood from a guinea-pig. It was sown with a droplet of the virus A in ⅛ bouillon, third generation, that is, with the same seed as served in all the other experiments. This new experiment can, therefore, be exactly compared to that in which the addition of blood was made to ordinary non-diluted bouillon.

Bacillary proliferation took place quickly and well in the sanguineous bouillon diluted to ½. At the end of eight days, we find, under the microscope, beautiful tufts of filaments and mycelium broken into segments, of which a good number are excessively short. These segments are free, or in masses; some spores exist, free for the most part.

Two mice and two guinea-pigs—one an adult and the other two days old—were inoculated with this culture liquid. The mice received one drop on the inside surface of the thigh; the guinea-pigs, two drops.

The young guinea-pig was found dead the next morning at 8 o'clock. Now, as the inoculation was done the night before at 6 o'clock, the animal survived the inoculation fourteen hours at the most. The condition of the cadavre shows that the survival was of

much less duration. The spleen is perfectly sound; it does not contain (any more than the blood, as to that matter) any trace of bacilli. If this is an anthrax infection, it is a purely local infection.

As to the adult guinea-pig, it presented characteristic œdema in the inoculated region. The inoculation was made on January 26, at night; the animal was found dead on the morning of the 31st; it, therefore, survived about four and one-half days. The autopsy demonstrated that it had succumbed to anthrax infection.

Finally, the two mice also died of anthrax—one at about the sixty-sixth, the other at about the ninetieth hour after the inoculation.

Here is (and I do not need to cause it to be remarked) a very interesting result, the most beautiful among those that have been obtained in this series of researches up to the present. The new conditions of the culture of the race A have re-established its virulence, not only in the mouse, but also in the adult guinea-pig. The effect of this culture, in which the toxicogenic material, that is to say, the blood, had as an auxiliary to the poverty of the bouillon, seems to have been still more complete than that of the culture in which the auxiliary agent of the blood was the imperfect anærobis. The anthrax infection, to which the adult guinea-pig succumbed, shows, in fact, that the restoration of the infectious aptitude, in the actual case, probably hastened itself towards complete restitution of virulence, such as kills sheep and the large domestic animals.

(*f*) *Effects of the Simultaneous Addition of the Two Auxiliary Conditions* (*Imperfect Anærobiosis, Poverty of Bouillon in Nutritive Materials*) *Which Favor the Revivifying Action Exercised on the Virulence of Anthracic Cultures by the Introduction of Blood in Kind in the Composition of the Bouillons.*

Here is the last attempt devoted to the restitution of virulence:

Eighth Experiment.—When the flask of the preceding experiment was stocked and sown, a part of its contents was placed in a Pasteur tube. This, then, enclosed bouillon diluted to $\frac{1}{8}$, with fresh blood added, and sown with the product of a culture of the race A, in $\frac{1}{8}$ bouillon, third generation.

The vacuum was effected, as already said, several times, in the interior of the Pasteur tube, in order to obtain the quasi-anærobiosis of the culture.

After a sojourn of eight days in the moist-chamber at 32°, the culture seemed to have developed all that it could. It has a very weak appearance. In fact, the liquid extracted from the tube shows itself under the microscope to be of an extreme poverty. It is necessary to have recourse to coloring in order to distinguish among the hematites and the white globules, either a few rodlets, of which the protoplasm is broken and *spaced*, or free grains of protoplasm—sorts of rodlets so short that they could be taken for spores if they had their refraction. There are, however, some free spores.

The poverty of this culture is such that I do not expect to find it active. It is by way of acquitting my conscience that I made an inoculation on two guinea-pigs, two days old, and two mice (one drop to each of the four subject).

In fact, the two guinea-pigs resisted perfectly, and never even appeared sick.

But it was altogether otherwise with the mice. Both died of anthrax with a certain rapidity. As death supervened during the night, the duration of illness could not be exactly told. It certainly did not exceed fifty to fifty five hours. In both, the spleen was very rich in bacilli.

Here, again, is a very interesting experiment. We did not see in it, it is true, the cumulation of effects respond precisely to the cumulation of the causes that the preceding experiments show capable of exercising on the recuperation of virulence. But the result is explained by the extreme poverty of the culture inoculated. There is room for believing that the conditions of the anærobiosis were pushed too far in this experiment, which rendered the proliferation of the bacillus altogether weak and difficult. The product obtained did not the less show itself virulent in mice, as virulent as in the anærobic culture in ordinary bouillon with blood added — a culture also poor enough, but incomparably less so than the corresponding culture in bouillon diluted to $\frac{1}{8}$ in question here.

To sum up, it is, therefore, these two cultures that killed the mice with greater rapidity, and that determined in the spleen a more abundant proliferation of bacilli. Under this head the special conditions of the two cultures, that is to say, the addition of fresh blood to the bouillons, and the imperfect anærobiosis deserve, perhaps, to be considered as the most favorable to the restitution of virulence.

But it must not be lost sight of that poverty of bouillon in nutritive material can also conspire to the restitution of virulence, as a case is given where a sanguineous culture diluted to $\frac{1}{8}$ was able to cause death by anthrax in two mice and an adult guinea-pig.

(*g*)—*Concerning the Exaltation and Restitution of the Recovered Virulence, by Means of Consecutive Inoculation.*—At the point that we have now reached, the question of the integral restitution of virulence in the race A of the bacillus anthracis, can no longer be doubted. In fact, as I have already said, there is no reason why passages more or less repeated of the recovered virus through the blood of the mouse, through the organism of that animal first, and of the guinea-pig afterwards, should not produce their usual effects on the elevation of the virulence. Nevertheless, it is well to make sure of it. I have not yet reached the end of my experiment. Here is what I have already done:

Ninth Experiment.—There was chosen as the initial virulent substance, the blood of one of the mice that died in consequence of being inoculated with the culture of Experiment 6 (quasi-anærobic culture in ordinary bouillon $\frac{1}{4}$ with added blood).

First Passage.—A small droplet of blood taken from the heart of the above-indicated mouse was inoculated under the skin of the thigh of two adult guinea-pigs, and of two mice.

One of the guinea pigs died at the end of three

and one-half days; the other after five days. There was produced at the seat of inoculation considerable œdematous tumefaction. Bacilli were numerous in the blood, and in the spleen.

In the mice, death supervened the next day after the inoculation. They scarcely survived twenty-two hours. Voluminous local œdema. Anthrax bacilli very abundant in the spleen and also in the blood.

Second Passage.—The rapid death of the mice leading to the belief that from the first passage the virulence of the bacillus was sufficiently exalted, a second passage was made through a guinea-pig only.

Two subjects were inoculated with blood from the heart of one of the two mice of the first passage. One required nearly three days, the other nearly four days, to die. This prolongation of the survival caused the fear that there had been too much haste in abandoning the passage through the organism of the mouse.

Third Passage.—A culture was made in ordinary bouillon ¼, with the blood of the guinea-pig that died the more rapidly.

Besides, two new adult guinea-pigs were inoculated with this blood.

This time the animals did not survive more than forty hours. The autopsy demonstrated in the blood and spleen a rich bacillary proliferation.

Fourth Passage.—One of the preceding subjects furnished blood for the inoculation of two adult guinea-pigs.

Of these two guinea-pigs, one died still more quickly than the preceding two, that is, in about thirty-five hours. But the survival of the other was more prolonged, because it attained to fifty or fifty-five hours.

In these two guinea-pigs the local lesion produced at the seat of the inoculation, while almost insignificant, did not prevent the bacillary multiplication from becoming most abundant in the blood and in the spleen.

Fifth Passage.—But one guinea-pig was devoted to this passage, besides two sheep, which will permit us to assure ourselves concerning the degree of advancement in the reconstitution of the virulence.

The inoculated matter was derived from the heart-blood of the guinea-pig that died in thirty-six hours in the preceding series. The sheep had already been inoculated the day before with a culture resulting from sowing blood from one of the subjects of the second passage. The double inoculation of the sheep was made at the school at Alfort, under the care of M. Nocard.

At the moment when these lines are being written, four days and three days have passed since the inoculations were made on the sheep, and these have not yet succumbed. They may, perhaps, resist, because the results observed in the guinea-pig allows it to be feared, as I have already said, that the number of passages through the mice had been insufficient.

But these sheep will certainly have acquired a strong and solid immunity following from the inoculation.

These inoculations of passage will be recommenced and continued. What will result? It is easy to foresee. From the moment we have restored virulence, for mice at first, and afterwards for guinea-pigs, it cannot be doubted that we shall attain the ability to restore it for other species less impressionable to anthrax.

At this hour, at all events, I am carrying on parallel cultures of the race A entirely deprived of virulence, and the same race A, with at least partially restored virulence. The first continues to be inoffensive, even to mice. The second kills not only the latter animal, but also the adult guinea-pig, and this in an absolutely sure manner.

To resume:

1. The restitution of lost virulence in generation of bacillus anthrax deprived, apparently, of all infectious property, appears as easy and as sure as the exaltation of virulence simply diminished in the cultures attenuated by M. Pasteur.

2. This change in the disappeared virulence can be sought only by means of culture *in vitro.*

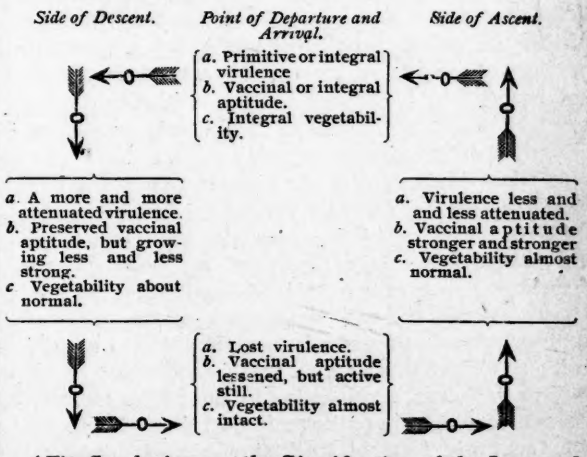
3. The *nature* of the bouillon employed as nutritive medium plays the principal rôle in cultures destined to recall virulence; fresh blood should enter into the composition of this bouillon. It is probable, but one would not wish to affirm it, that that of other species will comport itself in about the same manner.

4. It is proved that the imperfect anærobiosis favors the reconstituting action of blood added to bouillon.

5. A certain poverty of bouillon in nutritive materials is equally favorable to this reconstituting influence of blood.

6. The characters indicating the reconstitution of virulence are precisely inverse to those indicating the disappearance of this property. They can, therefore, be represented by the same figures read in a contrary sense, that is to say, from right to left, instead of from left to right.

7. The curves of vaccinal aptitude, and of prolific aptitude, follow equally the same inverse course in such a way that the complete cycle of modifications obtained in the double operation of attenuation and revivification can be represented in the following manner:


Side of Descent.
Point of Departure and Arrival.
Side of Ascent.
a. Primitive or integral virulence
b. Vaccinal or integral aptitude.
c. Integral vegetability.
a. A more and more attenuated virulence.
b. Preserved vaccinal aptitude, but growing less and less strong.
c Vegetability about normal.
a. Virulence less and and less attenuated.
b. Vaccinal aptitude stronger and stronger
c. Vegetability almost normal.
a. Lost virulence.
b. Vaccinal aptitude lessened, but active still.
c. Vegetability almost intact.

(*F*) *Conclusion on the Signification of the Loss and Recuperation of the Virulence by Pathogenic Microbes.*—What is the conclusion that results from the experiments and discussions previously considered? It is not doubtful, and scarcely needs to be formulated.

If lost virulence is not a destroyed attribute, but a lessened property, to the point of no longer being able to manifest its activity by its usual effects; if the recall of the lost virulence is not a complete reconstitution, but a simple revivification of that property; if, finally, even in their state of most complete infectious inertia, the microbes, heretofore pathogenic, still preserve in a remarkable degree their aptitude to create immunity, like still truly pathogenic microbes, from virulence, intact or attenuated, does it not follow that these metamorphoses of the virulence should not be considered as indices of transformation of pathogenic microbes into simple saprogenous microbes, or the inverse transformation?

But, while preserving their pathogenic nature, while remaining attached to their original stock through their fundamental character, should not the microbes that suffer these changes be distributed into distinct specific categories? It is an opinion that can be sustained, and depends on the idea that one forms from the characteristics of the species. But it is more simple and more plausible to see in these differences of activity only simple attributes special to related races.

The same pathogenic microbe can be very polymorphous; do we think of making species or even distinct races with forms as varied as we can obtain, either in the organism or in cultures *in vitro*? No. Why should the difference in properties, in physiological attributes have a different signification from the difference in material forms? Just as the latter change easily into each other, so pathogenic microbes can change attributes, and from the one to the other without losing their specific individuality.

In a word, polymorphism of pathogenic microbic species is perfectly accepted; it is, in the same way, necessary to accept their polydynamism, if I may permit myself this new term.

It goes without saying, that the present conclusion should be applied only to facts connected with this study. All reserve should be made on the subject of a general and definitive conclusion concerning transformations in pathogenic microbiology. It has not been demonstrated to me in fact that, in pushing further the action of cultures under the augmented pressure of oxygen, or by any other means, we should not succeed in modifying bacillus anthracis to the point of producing a species definitively outside of the group of pathogenic microbes.

(*G*) *The Utilization of the Conservation of the Vaccinal Property in Microbes heretofore Pathogenic, but the Virulence of which has been, not only more or less Attenuated, but wholly Destroyed, or, more Exactly Speaking, Rendered Incapable of Manifesting Itself.*—I have reached the end of my study of the point of natural history and general physiology that I wished to treat. We know to what we are beholden in regard to the actual signification of the loss or recuperation of virulence in pathogenic microbes. There are not, then, any facts of true specific transformation. The pathogenic microbes, that become inactive to the point of resembling purely saprogenous microbes, have not been separated from their race-stock, and still belong to the first category of microbic agents. They have, in fact, preserved their most precious attributes of infectious agents, that is, their power to create immunity by their passage through the animal organism.

It is time to say a few words concerning this conservation of vaccinal aptitude, and concerning the advantage that can be drawn from it.

The prophylaxis of anthrax diseases, so well assured already, will, without doubt, derive but meagre profit from it. It is not only bacillus anthracis that can, by culture, be entirely deprived of its virulent properties. Among pathogenic microbes that, in a given case, are identical, there even exist some that culture *in vitro* does not permit to exist with evident and certain infectious qualities, at least for animals employed for the purpose of testing these infectious qualities, or else the cultivated microbe loses them spontaneously with great rapidity.

Finally, there are some of these microbes, on the activity of which the number of the individuals thrown in exercises so great an influence that a reduction of this number can exactly balance even the destruction by the virulence. In my thoughts at this moment, as being near to splenic or anthracic fever, are a certain number of diseases that are equally known to me—Asiatic cholera, puerperal fever, glanders, even rabies, typhoid fever, and still others. I must explain suggestions that have come to me during the course of my experiments on the possibility of applying to the preventive inoculation of each of these maladies their infectious agents rendered inoffensive.

(*a*) *Splenic or Anthrax Fever.*—I have nothing to add to the instructions I have given concerning the vaccinal property of the families of bacillus anthracis rendered absolutely inactive by compressed oxygen. The demonstration of that property is absolutely peremptory. But it remains to me to examine a few points relative to the practical utilization of this aptitude.

Manufacture of Cultures for Vaccinal Use.—Nothing should be easier than to obtain in considerable quantity cultures in bouillon of special families, and thus to meet one of the indications of employing them vaccinally, knowing that the quantity of the material inoculated should be relatively abundant.

In order to obtain abundant cultures to conform to the indications previously given, normal bouillon ($\frac{1}{1}$) or bouillon diluted to $\frac{1}{2}$, placed in a thermostat at 32°, gives abundant cultures, in which sporulation is slow enough, especially with the bouillon $\frac{1}{1}$. It is well not to withdraw these cultures from the thermostat before three weeks.

Quantity of Liquid to Use in Inoculations.—After what took place in my two experiments, I estimate that cultures of the race A, or of all other cultures, *brought to the same degree of infectious indifference*, will always produce, in sheep, a sufficient immunity, if, in eight or ten days after the inoculation of one cubic centimeter of the liquid culture, a second one is made of two cubic centimeters. Naturally, the doses should be doubled for the bovine or equine species.

Number of Inoculations.—I have just spoken of two inoculations; are they necessary? Would not one be

sufficient, if it was copious enough? I am authorized to ask this question by the tables of temperatures in the experiments on sheep. The second massive inoculation did not appear visibly to modify the general condition of the subject, and it may be asked if the strong virus would not have acted after the first inoculation as it did after the second. It is something to be studied.

The inverse practice should also be studied; that is, the repetition, more or less hurried, of multiple vaccinal inoculations, with quantities of material small at first, and stronger and stronger. There is but small probability that this practice, copied after that of anti-rabic inoculations, will give as beautiful results as the latter. The manner of the preservative action is not the same, in fact, in the two cases, in spite of certain points of resemblance that I shall bring out further on. At the same time it will be interesting to inform ourselves by experimentation.

Duration of the Conservation of the Vaccinal Activity in Cultures.—By returning to my first work, on bacillus anthracis, attenuated by the action of compressed oxygen, we shall see that the cultures of that bacillus preserved their vaccinal properties during several months, even when the attenuation had been brought to where inoculation caused adult guinea-pigs only exceptionally to perish. This remarkable conservation is in contrast with the fugacious vaccinal aptitude in cultures of bacilli attenuated to the same degree by the intervention of heat, as in those of the first anthrax vaccine of M. Pasteur.

There is room to think that, in cultures in which all of the virulence has been made to disappear by the action of compressed oxygen, the conservation of the vaccinal properties is as well assured as in those that are simply attenuated. We have seen, in fact, that the culture A, commenced October 31, 1888, and inoculated for the last time on January 13, 1889, that is, about one and a half months afterward, in the experiment at Melun, produced very energetic vaccinal effects. This proves a duration of conservation very superior to that of the feeble vaccines obtained by the intervention of the action of heat. It will now be necessary to see, by the aid of direct experimentation, how long it will be possible to depend on these conserved cultures A to obtain fair or desired immunity.

Is it Necessary to Cause Cultures of Variable Vaccine Activity to Intervene Among Multiple Preventive Inoculations?—It is a long time since I answered this question in the negative. The *same* attenuated culture inoculated twice in the *same* case confers a greater immunity than if it is inoculated only one time in the same dose. For example, ten sheep, inoculated twice at an interval of ten days, with $\frac{1}{2}$ of a cubic centimeter of the same culture liquid, will all resist an inoculation of strong virus; while such a test with strong virus will cause the death of three to five out of ten, inoculated at the same time as the preceding, but once only, with the *same* quantity of the *same* vaccinal culture.

But it is certain that the effect of the second inoculation is more certain if it is made with a double or triple dose of vaccinal culture.

Now, what is true of simple cultures attenuated in their virulence, is equally so of cultures of lost virulence. My two experiments on the sheep and on the horse superabundantly prove it. With these cultures of lost virulence, we enjoy the same benefit as with the cultures of attenuated virulence. It is not necessary to occupy oneself in producing races of different vaccinal aptitudes. The same culture of the same race suffices for all the inoculations, if several are made, even when they are separated by considerable space of time.

Concerning Cultures of Bacillus Anthracis Deprived of all Virulence by the Intervention of Agents other than Compreseed Oxygen.—A question that merits to be examined, is the comparison of properties—the vaccine properties especially—among the cultures of anthrax bacilli deprived of all virulence, some by the action of compressed oxygen, others by the intervention of other agents—particularly heat. Would the former comport themselves like the latter? For example, when the first vaccine of M. Pasteur, preserved during a certain time after its separation, seems then to have lost all activity, even the most feeble vaccinal aptitude, is it in reality despoiled of that property? Could it not be put in evidence by the employment of relatively enormous doses? This is for experimentation to answer.

(*b*) *Asiatic Cholera.*—If, as it is scarcely possible to doubt now, the Komma-bacillus is the agent of Asiatic cholera, are we not permitted to found the largest hopes on the utilization of cultures of this microbe in preventive inoculations? I developed, in 1885, at Grenoble, before the Congress of the Association for the Advancement of the Sciences, all the arguments which plead in favor of such utilization, and of the advantages that it has perhaps been possible to draw from them. To-day my opinion of that time finds itself singularly reinforced by the discovery of energetic vaccinal properties in races of heretofore pathogenic microbes, actually deprived of all virulent activity.

The fact is that the principle objection brought against inoculations with a preventive view, with cultures of the Komma-bacillus, was furnished by the apparent inertia of the cultures. This microbe, which is so easily cultivated *in vitro*, manifests its infectious activity very rarely and very imperfectly, especially when inoculated under the skin in man. It is true that the penetration of the virus takes place otherwise than through the natural channel of infection; the artificial channel employed to bring about this introduction of the virus in the organism, influences perhaps energetically (this certainly occurs in the case of the inoculation of other viruses) the activity of the infectious virus.

What does this signify? We shall not the less find ourselves in the presence of a microbe endowed with perfect vegetability, and which does not determine infectious effects when it is inoculated. It is in a manner the natural equivalent of my *bacillus anthracis* become artificially inactive by the intervention of peculiar conditions of culture. If the latter creates immunity, there is no reason why the former should not equally create it, provided that we employ this latter in massive doses, more or less repeatedly.

It is, as we see, the microbe itself, that I put into play for the creation of immunity. Does this mean that I refuse all intervention of the chemical materials of the culture, an intervention invoked for the first time by M. Ferran, in the mechanism of the immunity by his anti-choleric inoculations? No. The vaccinal material already formed of the culture employed, precedes in its action that which will be produced at the breast of the organism by the microbes. It is two influences that unite. The case should occur, sometimes, perhaps even with anti-anthracic inoculations.

(*c*) *Rabies.*—For example, this double intervention does not create a single doubt in regard to anti-rabic inoculations. In the beautiful method established by M. Pasteur, there is but little to doubt that the chemical materials contained in the marrow used in the inoculations play their rôle of preventive action. But it is perhaps more certain that, without the essential agents of conserved virulence in small quantity in the marrows that furnish the most active vaccinal emulsions, preservation does not occur. That there are in these emulsions vaccinating chemical materials of a greater activity, it is not known how to demonstrate, but that is probable. Per contra, it is absolutely proved that the proper agents of the virulence are present and living in these emulsions. Can they be excluded from the *processus* that creates the immunity? Is it not more rational to admit their intervention, put them in play, rendered benign, as much because of the mode and conditions of their penetration of the organism as by reason of their small number? We there find reason (I have already said it elsewhere) for a new application of the principles of the influence of the number of the infecting agents on the nature and intensity of the infec tion.

(*d*) *Glanders.*—I have made a certain number of attempts to produce with equinial humors benign effects accompanied by vaccinating action, in the horse and the ass, by injecting in the veins very small quantities of the humor. My attempts were completely fruitless. I shall return to the subject. But I propose especially to ascertain if the equinial humor, deprived of all virulence, does not possess a vaccinal aptitude. In growing upon potatoes this agent transforms itself quickly enough into a microbe that seems deprived of all infectious activity, and which appears to have become simply chromogenous. It will be interesting to see if, as in the example of bacillus anthracis, to which was conferred the appearance of a purely saprogenous agent, this benign equinial microbe would not have the power to create immunity against the action of those members of its family that have preserved their virulent properties.

(*e*) *Puerperal Septicemia.*—The streptococcus that causes at least $\frac{19}{20}$ of the puerperal accidents is admirably cultivated in mutton or chicken bouillons, but very quickly loses therein its infectious properties, which it recovers not less quickly in the salted bouillon of beef. (Arloing). In my researches on puerperal septicemia I completely neglected the inert cultures. Now, I have no longer the right to put them aside. Because they are no longer infectious, it does not necessarily follow that they have become purely saprogenous. They may be in full possession of energetic and precious vaccinal properties. I have before me a certain number of facts that permit me to believe it. It is easy to verify, since at least one species of animal, the rabbit, is particulary sensitive to the action of the virulent microbe. But I shall demonstrate this subject in a separate work, in which I shall have to explain in advance on the definition and character of immunity in the matter of puerperal septicemia.

(*f*) *Typhoid Fever.*—It will be very important to be able to discover if the bacillus d'Eberth, which is so easily cultivated, presents, as does the streptococcus of puerperal septicemia, properties varying with the conditions of the cultures. Unfortunately, it is difficult to assure ourselves of it by inoculations on animals. The active reagent consecrated to this research should be at once, in fact, particularly sure and sufficiently sensitive. Does there exist a species of animal easily to be handled, in which these conditions are united? It is very doubtful, if I may believe the sufficiently multiplied researches that have been made in my laboratory. In the actual state of our knowledge, it is to the human species that it will be necessary to address ourselves.

Who will dare to do it? There may not be more risk than in inoculating in man cultures of choleric bacilli. In spite of the positive results of a few experiments recorded in the annals of pathogenic microbiology, it would be difficulty to say actually if the bacillus reproduced in cultures is really infectious. However, let us suppose that it is, who could affirm that the inoculation of the product of one of these cultures in the conjunctive tissues would communicate typhoid fever to man? It is the digestive tract that is the port of entry favorable to the virus, that which opens way to the infectious action of the microbe. It is very possible that conjunctive tissues constitutes a poor medium for the evolution of this microbe, and that in entering through that channel, the latter is only able to produce that totally rudimentary infection that creates immunity.

(*g*) *Resumé.*—Recapitulating, this summary review does not weaken the value of the general views that I believed myself able to deduce from my work on the conservation of the vaccinal aptitude in the bacillus anthracis deprived of its pathogenic function.

Among the viruses that we succeeded in propagating, outside of the animal economy, there are some, the cultures of which can give out spontaneouly or by the influence of an artifice, products deprived of all infectious activity, or else when introduced into the organism by the natural routes of infection, and, for a few, when they are employed in very small quantity. Whatever the degree of annihilation of the infectious property in these viruses, we are authorized to seek in them the existence of vaccinal properties more or less energetic.

The conferring of these vaccinal qualities is not even interdicted to viruses which we have not yet succeeded in cultivating and to deprive them of their virulent properties. The frequent repetition of inoculations, by channels properly chosen, with quite reduced quantities of virulent agents, is theoretically

apt to create immunity, if we succeed in preventing these inoculations from causing a mortal infection.

Here are views that can serve as a point of departure for new experimental researches, devoted to the extension of the method of preventive inoculation.

It is my duty to indicate them. But I shall feel especially satisfied if attention is called to my purely scientific contribution, and to one of the most important points of the natural history and general physiology of pathogenic microbes.

GERM ANTAGONISM.[1]

By H. R. WILDER, M.D.

WE shall not use the term germ in accordance with the strict definition of the same, but in accordance with its generally accepted use in relation to disease, meaning to embrace the source of all organic life in its various forms from the embryo up through the progressive stages of development, through which it may influence other living organisms.

The term Life is a very comprehensive one when applied to the species or individual. For the known species of the universe visible to the naked eye alone in the fauna and flora are numbered by the hundreds of thousands. Then the species of the microscopical world are equally numerous, only they have not all received their name.

Then, as we grope on into that great and mysterious darkness, into which the microscope, endowed by human ingenuity, has, as yet, been unable to fathom, and there count the untold influences which when combined under right circumstances, give distinct results as specific as any of the species of the visual world, then can we begin to comprehend the extent of *life*.

These so-called unseen combined influences, which are the cause of the specific results, when summed up are but germs with another name, either in their development in the grades upward in life, or downward in death. Thus, as we contemplate life we dwell upon death, for out of life comes death, and from death life gathers sustenance.

Is it not so that life devours life? or, in other words, feeds upon what has been created by life, and the cycle is completed where death joins life?

Let us, then, divest ourselves of the thoughtless idea that there is no life beyond our present power to examine; for who is prepared to say but that there is, and may yet be found, in the pre-microscopical world, or the mystic realm unseen, the germs peculiar to itself, and distinct in its nature, that give rise to certain effects denominated disease?

We say not that all germs produce disease any more than all seeds produce thistles, or other noxious weeds. But as the microscopical world is opened to us, we become aware that we are continually surrounded by germs of many varieties.

Miquel, for instance, has found that the ordinary atmosphere of a large city contains over 2 000 bacteria per cubic yard, while the air of the room of an old house in winter will show bacteria to the amount of 4,500 per cubic yard, and again that the wards of a long-used hospital will hold as many as 90,000 germs in the same space.

Observation seems to show that the different varieties require different conditions for development, each species varying in its susceptibility to different influences.

That certain diseases are epidemic or endemic undoubtedly depends upon the local and atmospherical influences which favor the development of those specific germs, and also on some influences producing in the system a condition or soil especially favorable for their reception. Or it may be that the local influences have multiplied, or permitted to multiply, the specific poison or germs, to such an extent that the myriads in defiant hosts settle down upon and infect the unfortunate being, giving rise to the special symptomatology. It is probable, therefore, that we must have both the presence of the specific germs, and also a fit condition of the system for their development.

For persons of good constitutions, and sometimes constitutions not entirely healthy, may pass through epidemics untouched, while others of a debilitated, or of a certain condition, will be quick to receive or develop the disease.

It would no doubt astonish us if we could know how extensively the poisons that exist around and come in contact with us in different ways, are resisted, rejected and overcome by the human organism.

That these poisonous influences are of a specific kind, and give rise to a specific disease, is just as probable, as that the germ of the oak acorn will grow an oak, instead of a pine, or that the germ of the wheat will produce wheat instead of oats.

What are the diseases scarlatina, pertussis, diphtheria, but the infested human system overpowered by the rapidly reproduced specific poison peculiar to each respectively, and that these germs have only to exhaust the soil to become extinct, or, in other words, terminate the disease? Facts have been adduced which prove conclusively that the morbid poisons, whatever their form or classification may be, act in all instances not capriciously, but according to certain definite and fixed laws. Mingled with the blood yesterday, to-morrow, after having had a period of latency, swarming into innumerable myriads, possessing the whole field as a pest, devouring everything before them; in short, passing through the various stages of transition, germination, growth, maturity, and finally death.

Such are the remarkable laws of morbid poisons, that many of them possess the extraordinary property of exhausting the constitution of all susceptibility to a second action of the same poison, as is the case with syphilis, scarlatina, measles, typhoid fever, small-pox, whooping cough, and indeed with a considerable number of others.

And in fact temporary protective influence is imparted by most all morbid poisons, for few persons suffer a second attack of the same specific epidemic disease, and at least the susceptibility of the constitution is temporarily impaired.

These morbid poisons or epidemic influences are now nearly and soon probably will become entirely

[1] Read before the Vermont State Medical Society.

synonymous with the term germ, as used in its ordinary broad meaning.

But that some of the numerous organic forms are actually necessary cannot be intelligently disputed; for, as Sir William Roberts says: "Without saprophytes there could be no putrefaction; and without putrefaction the waste materials thrown off by the animal and vegetable kingdoms could not be consumed. Instead of being broken up as they are now, and restored to the earth and air in a fit state to nourish new generations of plants, they would remain as an intolerable incubus on the organic world. Plants would languish for want of nourishment, and animals would be hampered by their own excreta, and by the dead bodies of their mates and predecessors. In short, the circle of life would be wanting an essential link. A large proportion of our food is prepared by the agency of saprophytes. We are indebted to certain bacteria for our butter, cheese and vinegar. Our daily bread is made with yeast, and to the yeast plant we also owe our wine, beer, and spirituous liquors."

This tiny cell, as a generator of alcohol, plays a larger part in the life of civilized man than any other tree or plant.

It is not necessary to look to that extreme of spontaneous production, for these germs readily enough multiply when they find the desired soil. They may exist either upon or in plant or animal, and be transmitted or communicated indifferently from animal to man or man to animal, or from vegetable to animal. For plants, as well as animals, have their peculiar parasites and parasitic diseases. They may be either vegetable or animal. The oak apple or gall nut is a familiar example of the large animal parasite affecting a plant. Then there are the blights, mildew, smut, brand and other forms of fungi that are capable of propagation and transmission.

Yet each species is affected more particularly by its particular parasites, and these are themselves affected by their own parasites, and so on almost indefinitely, each one antagonized by some other. This series might be continued on down through the microscopic field into that which has not yet been explored, and including those influences or germs that affect the human organism in such a manner as to cause the condition we call disease; for who can dispute but that all infectious, epidemic, endemic and malarial diseases are but the result of a special multiplying parasite or microphyte infecting the blood or tissues of the body. That these special germs do not always multiply or develop, causing disease, is no more a cause of wonderment than that germs of a higher order of life do not always find lodgment in a soil adapted for their development.

The seed of fire-weed, for instance, may pass over hundreds of acres of tilled soil and miles of forest before it finds a suitable place prepared by fire for its growth. So, too, smallpox germs may be present, and some systems be very indifferent to their reception, because the soil is not just right. So, also, there is the inherent power of all organized life to resist oppression.

The power of the human system to resist poisonous influences is something remarkable; yet, when infested by rapidly multiplying hordes of life, it often succumbs for a time, or, in other words, the system is overpowered until the soil is exhausted and the germ dies for want of food, or is swallowed up by other germs.

And so we are only to stop and reflect of the many ways in which the body is beset by these antagonizing germs—the air we breathe swarming with its clouds of life, the food we eat and the water we drink permeated in every particle, and the primordial cells, whenever uncovered by accident or the surgeon, sought after with an insatiable and rapacious appetite by these mysterious beings—then we may begin to comprehend the unlimited power that relentlessly antagonizes back to the mother dust.

SWANTON, VT.

Society Notes.

NEW YORK ACADEMY OF MEDICINE.

SECTION ON ORTHOPÆDIC SURGERY.

Stated Meeting, March 21, 1890.

V. P. GIBNEY, M.D., Chairman.

DR. JOHN RIDLON presented a case for diagnosis.

DR. GIBNEY considered it a case of cervical rotary scoliosis, with a cyst over the scapula. He had seen one or two cases of cystic tumor in this region, and the diagnosis of scoliosis was made by the position of the right shoulder, the drawing of the head to that side, and, on the patient's bending forward, a deviation of the spine to the right.

DR. SAMUEL KETCH agreed in the diagnosis of rotary lateral curvature, which he thought was congenital.

DR. L. PUTZEL found some enlargement of the spine of the scapula, and muscular spasm of all the muscles inserted into the inner border of the scapula.

DR. A. B. JUDSON thought there was evident scoliosis.

DR. W. R. BIRDSALL was of the opinion that most of the deformity was the result of muscular spasm. An electrical examination ought to settle the question.

DR. A. M. PHELPS said that, in a growing child, such a condition of scoliosis was often secondary to muscular spasm.

DR. RIDLON said that he had been unable to obtain any history which would account for an irritative lesion at birth, and he had only just learned that the child had been etherized by Dr. Gerster two days ago, and that the swelling had entirely disappeared.

DR. T. HALSTED MYERS presented a case of "Double Congenital Malformation at the Knee, with Hyperextension and Talipes." The patient was born at term, after an easy labor, by a breech-presentation. The feet had been closely applied to the head, and the quantity of liquor amnii had been normal. The marked flexion of the thighs had been gradually overcome at the end of eight months; but at the age of sixteen months the thighs could not be extended beyond the straight position; both legs were hyper-

extended to 140 degrees; there was equino-varus, marked on the left side and moderate on the right. Neither patella could be felt. The inter-condylar grooves were shallow; the tibiæ glided forward into partial dislocation, and there was marked genu-valgum, with abnormal lateral mobility at the knee. The body was otherwise normal; and there were no evidences of cerebral defect. The muscles responded well to the Faradic current, but in a less degree on the right side. The flexors of the thigh were in constant active contraction, and the condition of the posterior leg muscles seemed to be one of structural change. The deformity had been considerably reduced in two weeks by means of a brace, which maintained flexion at the knee.

Dr. Myers presented brief notes of several cases which had been already reported by some of the members of the Section. The absence of cerebral symptoms in these cases pointed to the cord as the seat of the lesion. The muscular spasm seemed to disappear about the third year, or even earlier, and the prognosis, as regards the usefulness of the limbs, was very good. There was nothing in these histories, however, to show that the fœtus had maintained the position found at birth. This position approximated the insertions of the anterior thigh group and the posterior leg group, which might very easily account for the structural changes in the muscles, and consequent shortening and deformity. Nor was it surprising that the patella, which was practically a part of the quadriceps tendon, should share in this mal-development; but the character of the labor itself ought to have but little influence, as the cartilage of the patella appeared in the third month of fœtal life.

Dr. R. H. Sayre related the history of a similar case, and exhibited photographs showing the condition immediately after birth, and again six months later. The labor and the quantity of liquor amnii had been normal, and no cause could be assigned for the condition.

At the present time, the leg could be flexed on the thigh to about 45 degrees, and extension was possible only to a straight line. The shortening was three-quarters of an inch. No patella had yet been found.

Dr. Ketch said that, in a collection of fifty-six cases of congenital dislocation, reported by Dr. Hubbard and himself, there was only one congenital dislocation of the knee, and this was unilateral. The literature of the subject was still very meagre, Noble Smith being the only author he had found who spoke of the condition at length. The treatment which this author advocated had yielded uniformly good results.

Dr. Le Roy W. Hubbard, by invitation, presented the report of a case of Pott's paraplegia treated by suspension, after the method suggested by Motchoukowski. The case was one of those untractable ones that had resisted ordinary methods of treatment. Drs. Ketch and Hubbard had employed daily suspension for a few minutes, and a decided daily improvement was noticed within a month; but a complete cure had not been established up to the time of the report.

Dr. Putzel said that his pathological studies had led him to believe that the majority of cases of Pott's paraplegia were not due to pressure, but to a transverse myelitis; and his experience with the treatment by suspension had taught him to consider it a method which was, at best, only a temporary relief. Very rapid improvement often followed many methods of treatment. Large doses of iodide of potassium had not yielded him very satisfactory results. It was important to remember that the disease showed a strong tendency to spontaneous recovery.

Dr. Birdsall thought that, where Pott's paraplegia was due to myelitis, the disease was fatal; but many cases were due, not to a myelitis, but to irritation and pressure on the anterior or posterior roots of the nerves in their passage through the foramina. Among the various theories which had been advanced concerning the action of suspension, he thought that the most plausible one attributed the beneficial action to a slight separation of the vertebræ, with consequent improvement in the circulation of the affected parts, particularly the nerve roots. This was what might be expected from our knowledge of nerve-stretching; and, on this account, he thought the method somewhat dangerous. For many months after Charcot called attention to the method, the literature of the subject was very extensive; but, more recently, it had become quite scanty. It was particularly strange that these early investigators had not furnished any later reports.

Dr. L. C. Gray said that, excluding those cases which were complicated by organic lesion of the cord, he thought that the etiology of Pott's paraplegia could be explained by reflex causes. Nerve stretching in this disease was a very different thing from what it was in locomotor ataxia. The latter disease had a very complicated pathology, and embraced several distinct varieties. It was a very significant fact that the results claimed by Charcot had not been obtained by other observers. He did not think that the treatment by suspension, when properly managed, was dangerous, and where the paraplegia was of reflex origin, he would look for temporary relief, and, in milder cases, even a cure was not impossible.

Dr. W. R. Townsend reported two cases which he had treated by extension in bed, according to the method described by Wm. J. Fleming in the *Lancet* for 1889. He had modified the arrangement for extension, by using a jacket around the pelvis, with straps passing down on each side. Both cases had received large doses of iodide of potassium in addition to extension; and both showed the improvement noted in Dr. Hubbard's case.

Dr. Ridlon said that he had made use of large doses of iodide of potassium, the actual cautery, and of horizontal traction while in bed; but he had been unable to see any favorable modification of the disease by any of these methods. He now kept his patients on their backs, and waited for them to get well. One case recovered perfectly after three years.

Dr. Ketch said that he had suggested the use of suspension in the case reported by Dr. Hubbard, after the paralysis had lasted for about three years, and

had not been improved by recumbency, or the use of iodide of potassium.

Dr. R. H. Sayre said that the treatment of Pott's paraplegia by suspension had been practiced as long ago as 1828 by J. K. Mitchell, of Philadelphia. Suspension failed to give relief when carried to excess, and it was dangerous if injudiciously applied. These cases should not be left untreated, for their chances of becoming permanently paralyzed were thereby increased. Constant traction by means of the "jury mast," and traction with recumbency, were both very useful methods. By making use of extension with the patient in the "wire cuirass," his father had been able to employ traction with recumbency without depriving the patient of the benefits of fresh air.

Dr. Phelps considered that the employment of suspension, at a period when the disease was still active, was bad practice; and the great majority of cases recovered, if the spinal column were only fixed.

Dr. Hubbard did not think that pressure on the nerve roots could be of common occurrence; for, sensory symptoms rarely appeared, and then only in the later stages.

Dr. A. B. Judson read a paper, entitled

A CRITICISM OF WILLETT'S OPERATION FOR TALIPES CALCANEUS.

He stated that in this affection, the deformity was of less importance than the disability, which prevented the patient from resting on the toe in walking —a disability, which Mr. Willett sought to remove by shortening the tendo Achillis. The writer demonstrated that the tension on the heel-cord greatly exceeded the weight of the body; and expressed the opinion that the tendon, shortened by operation, would not long endure the strain without yielding. He advocated the mechanical treatment of this disability, and presented a brace, which was easy to apply, convenient to wear, and inexpensive.

Dr. W. E. Wirt, by invitation, gave a mathematical demonstration, showing that Dr. Judson, in his calculations, did not make any allowance for the action of the other muscles; and that when these were considered, it was found that the tension sustained by the tendo Achillis was at no time more than 1.4 times the weight of the body.

Dr. Royal Whitman, by invitation, read a paper on the

RATIONAL TREATMENT OF FLAT FOOT,

and showed some plaster casts of cases he had treated.

Dr. Willy Meyer presented two cases of flat foot which he had treated by supra-malleolar osteotomy, and showed photographs and casts illustrating the condition of the patients, before and after the operation. He considered the method a most rational one; for it required the patient to step upon the outer border of the foot, so that the weight of the body was transmitted through the cuboid, instead of through the seaphoid bone. Dr. Whitman's results were excellent; but they had been obtained in comparatively young subjects, after six months of treatment. The method which he advocated would secure permanently good results in as many weeks.

Dr. R. H. Sayre remarked that Mr. Golding-Bird, who was the first to do these operations, found less frequent occasion than formerly to resort to this method, as he was able by non-operative measures to relieve pain, and in great measure, to remove the disability.

ALLEGHENY COUNTY MEDICAL SOCIETY.

Special Meeting, March 18, 1890.

W. E. Johnston, M.D., Vice-President, in the Chair.

Dr. A. S. Daggette reported a case of a woman, seven months pregnant, who aborted four days after a fall. The child lived about forty minutes; the skin on its lower extremities and on the lower part of the abdomen had the appearance of being parboiled, and peeled off on handling, leaving large, livid, mottled spots. This macerated condition existed only in the localities named. The after-birth was normal. No history of syphilis.

Dr. Macfarlane thought the condition undoubtedly due to syphilis.

Dr. F. H. Edsall reported a case of

MALFORMATION OF THE EXTERNAL AUDITORY APPARATUS.

The patient, Ida G., aged eight, is of Jewish parentage, is delicate and rather anæmic. The immediate cause of consultation was constant pain in the right ear. This pain was neuralgic in character, although there was shown, upon examination, to be a recent slight purulent otitis existing in this ear. The otalgia had been of much longer standing, showing that no connection existed between the two. This ear presented no appearances different from those customarily seen in cases of acute otitis media, it was normal in all its parts in as far as its development is concerned.

The left ear was a marked instance of arrest of development during fœtal life. The entire auricle is small, probably not more than half the size of its fellow, and its several parts show a varying degree of imperfection in development. The helix, particularly near the upper margin of the auricle, is almost wanting, and the fossa of the helix is correspondingly imperfectly developed. The anti-helix is also scarcely to be traced, and the fossa of the anti-helix is, consequently, lacking also, and there is no trace of anything resembling a tragus. The anti-tragus and lobule are more perfectly, or, rather, less imperfectly developed than the other parts, but these too fall short of full development. The concha is very small and shallow. An external auditory meatus is lacking, and the only indication of the site of such an opening is a shallow depression, probably about one millimetre in depth, in the skin over what would otherwise be the outer opening of the external auditory canal. Upon making firm pressure over the center of this depression, it is possible to deepen it somewhat, indicating thus that there exists beneath at least a cartilaginous canal. Hearing on this side of the head, as was to be expected, is entirely absent. Neither the ticking of the watch, nor of Politzer's "Hörmesser" can be heard even on close contact, according to patient's statement. Absolute reliance

could not be placed on patient's statements in regard to this, as she is timid, and is, moreover, somewhat dull of comprehension. But as it usually is in such cases, that the middle ear and Eustachian tube share in the defect in development, it is more than probable that her statements were correct. The hard palate is, not infrequently, affected by the same arrest of development which overtakes the auditory apparatus, but in this instance nothing of the kind was observed.

As to what is best to do in a case like this, I think there is but one thing to be said; let it alone. Surgical interference would be meddlesome, for, aside from the difficulty which would be experienced in preventing an artificial opening from closing up again, there would be little probability of such artificial canal proving of any benefit. The reason for this can be readily understood, when we consider that, according to Virchow, these cases are due to a disturbance in the process of closure of the pharyngeal cleft, early in fœtal life. Therefore, inasmuch as the external ear, the tympanic cavity and the Eustachian tube are all developed either from the first pharyngeal fissure, or the first and second pharyngeal arch, it usually follows that marked imperfections in the development of the external auditory apparatus are accompanied by corresponding defects in the other portions of the auditory apparatus, developed from the fœtal structures named. In consequence of this, even if an open pathway for sound-waves were successfully maintained, the results, in cases like the one I have named, would probably be nil, due to defects in the tympanum.

Moreover, in a patient as old as this one, I am inclined to believe that even were the tympanum fully developed, hearing would, at best, be very imperfect, because of the long-continued disuse of the organ, just as we find a squinting eye becoming amblyopic in the course of time from lack of use, although I have no data bearing on the subject of the effect of disuse on the auditory nerve.

Cases like the one I have related, while not extremely rare, are sufficiently so to make them of interest as curiosities, although they are of little practical value.

Dr. Lippincott: Four patients presented themselves at my office, within three weeks, with foreign bodies which had entered the eye, and in the first three cases I made an effort at extraction with the magnet. In two I succeeded in withdrawing the steel from the neighborhood of the retina and the optic nerve with the magnet, and there was a recovery of a moderate degree of vision. In the third case, suppuration took place subsequent to the removal of the steel; the steel was removed at the operation, and everything appeared to go well for about six days, and then irritation appeared and suppuration subsequently occurred. In the fourth case the patient was so positive that nothing had entered his eye that, although all the signs pointed in that direction, I did not feel like taking the responsibility of urging an operation, because, if steel was not in his eye, any operation would have interfered with its recovery. The man went to the point of refusing an operation. He went home, and returned in two weeks with severe inflammation of the eyeball. I enucleated the eye and found a large piece of steel.

The cases are not specially instructive, except in so far as to suggest that if the foreign body happens to be of steel or iron, or something that will respond to the magnet, an effort should, perhaps, generally be made to withdraw it. There are cases, of course, in which that would scarcely be allowed, as from the nature of the injury, an inflammation of the eye might be excited, which would involve the other eye. But if the wound happens to be not in a very vital point, an effort should be made to withdraw the foreign body, and in that my experience lately would seem to show a certain degree of success can be anticipated. The last case was instructive, as showing how little dependence is to be placed upon the opinion of a patient. The patient generally thinks that nothing went into the eye; in nine cases out of ten, I do not believe the patient thinks a foreign body has entered the eye. The man in my case was certain.

Dr. Allyn: I have had a case quite similar, about two months ago, which has bothered me a good deal, owing to the lack of activity in the inflammation. The man was struck by a fragment of steel, which punctured the cornea, and cut a hole directly back through the iris. He reached my office within two hours after the injury, when he was absolutely blind to all light; could not see a finger or anything. He maintained, as the doctor has said they all do, there was nothing in the eye; he had simply been struck in the eye, and a physician had removed the foreign substance. I told him it was my opinion the steel was in the eye, and asked him to inquire of the physician if it was really a metallic substance he had picked out, and on his return he told me that it was nothing but a piece of dirt. I told him to come back in a day or two, giving a chance for inflammation. The next day he returned feeling perfectly comfortable, and has never had to this time a particle of pain. There was a small particle up in the anterior chamber, which resembled metal covered with pus, and for two or three days I was uncertain whether or not it might be metal. Finally, under the treatment, the particle completely cleared, leaving adhesion of the inner border of the iris to the anterior surface of the lens. He continued to get better, and maintained there was nothing in the eye; I strongly maintained there was something in it, but the patient wishing no operation, I left the case from time to time, the eye improving; but at the last examination I found a band reaching through the lens and striking backward into the center of the eye. At the end of that band I am sure there is a piece of metal.

Dr. W. C. Shaw: I was called recently to examine a man for life insurance, a very healthy man, who said he had not had occasion for a family physician for himself, never having been sick. When he was about to go, I asked for a specimen of his urine. In the bottle the fluid looked as clear as crystal. I put the specimen in my pocket and came to the office and examined it, and found it to have a specific gravity of 1012, and to be full of sugar. This is the only specimen of so low gravity and containing sugar, I have ever had.

DR. LIPPINCOTT: That is very low specific gravity. I saw a case of saccharine diabetes in Philadelphia before I came to Pittsburgh, and the man had lived twenty-five years with that sort of urine. Dr. Austin Flint, Sr., had told the man twenty-five years before I saw him that he would be dead within a year; but the man told me he was enjoying fairly good health at that time.

DR. LANGE: Dr. Shaw's case is peculiar, inasmuch as urine with a specific gravity of 1012 full of sugar is a rare specimen. In the text-books and pocket-manuals for the examination of urine, you will frequently find it stated that no urine of a specific gravity of less than 1012 can contain sugar. Dr. Shaw's case—the urine presenting a specific gravity of 1012 and full of sugar—is an exemplification that this statement is erroneous. I, myself, have more thon once obtained specimens of less than 1020 specific gravity, which, though not "full," contained some sugar.

DR. MCCANN: The following case recently came under my observation. A German, suffering from cancer, which involved the rectum about three inches above the verge of the anus, in which the whole anterior wall was involved, and fully three-fourths of the rectum, the disease extending fully two inches up the rectum. The patient, suffering from the distress which attends this condition, came under my care. The question as to excision of the rectum or colotomy came up. I determined to resort to another operation—one which does not involve the technique of a formidable excision, but which is equally effective. The patient being etherized, and placed in a proper position, I introduced my finger into the rectum as far as I could, and then, with a Volkmann's spoon, scraped out the growth slowly, piece by piece, avoiding the wall of the bladder in front, the base of the bladder, and guarding against entering the peritoneum. Thus, by a careful and slow—not an elegant operation, by any means—but a careful scooping out, just as is the habit in scooping out cancerous growths from the cervix uteri, I was able to remove the entire growth. In doing this, I did not destroy the external sphincter; I did not damage the wall of the bladder. I avoided opening the peritoneal cavity, but I certainly cleaned away every portion of diseased tissue, down to the peritoneum. The operation required a considerable length of time. Fortunately, the sphincter was so easily dilated that I had abundance of room, and, after having removed a portion of the mass, was enabled, by the use of the Sims' speculum, to hold back the posterior wall of the rectum—the portion least diseased—so that I had a very fair view, and, drawing down the rectum, I was able to get beyond the diseased area, and into that portion of the rectum where I found the mucous membrane was normal. After having done this, the surface was carefully washed with an antiseptic solution, and the bowels plugged with iodoform gauze. The bowels moved on the third day. The rectum was again washed out, plugged for a time with iodoform gauze, and afterward allowed to remain without any treatment whatever. The result was that the distressing pain from which the patient suffered was relieved at once. Since that operation, six months have elapsed. During all of this time, until quite recently, the patient has been free from pain. Recently, however, a new growth, or rather a recurrence of the growth, has appeared upon the anterior wall of the rectum. The patient has promised to come back for a repetition of the treatment. As a result of this operation, there was no incontinence of fæces. The external sphincter was left undisturbed. The internal sphincter was involved in the growth, and removed; he had, however, control of the bowels. The operation did not result in contraction or stricture of the rectum. Recently I assisted a friend in the removal of a cancerous growth from the rectum, in which a more formidable operation was undertaken. The perineum was split from the point of the coccyx clear into the rectum, and then an effort was made to cut out the diseased tissue. A portion of the diseased tissue was removed, but the growth was so extensive that its complete removal with the knife had to be abandoned. It occurred to me at the time of that operation, and in thinking over the matter since, that the safer operation is to simply scoop out all of the tissue possible, to clean away the diseased tissue, and to make your patient as comfortable as possible, because you cannot hope to remove a malady which is going to destroy him sooner or later.

The Polyclinic.

PHILADELPHIA HOSPITAL.

TYPHOID FEVER.

THIS little child had a temperature which rose to 102.5° F., and has been intermittent ever since. The child became restless, and moaned for several days. At first, it seemed as if it had catarrh of the bronchial mucous membrane; but it had not. We then feared effusion into the ventricles of the brain, and meningitis. From the temperature of the child, one might expect acute tuberculosis, or tubercular meningitis. If it does not die, it has not tubercular meningitis, for this condition would cause sure death. The condition here is not tuberculosis, for it would have died ere this.

I think it may be typhoid fever. Treatment has been symptomatic. When there was evidence of congestion of the lung, it was given a warm bath. The stools are thoroughly disinfected. Stimulants, and good, easily-digestible foods were given. Cold to the head for high temperature. No narcotic would give relief. There is a cardinal point in treating a child, and that is, you must stimulate early, and not wait for a weakened heart and low pulse. Do not change your methods of treatment too often in children, as it will irritate the delicate mucous lining of their stomach.—*Davis.*

SUFFOCATIVE BRONCHIAL CATARRH.

A little girl, aged five or six years, has had a temperature varying from 107°–99° F. She had a slight bronchial cough, and on several nights had a few great paroxysms of cough; but, with all this, there

was no prostration. Two days ago, she was taken with this exacerbation of temperature, and there was no benumbing of the reflexes. Pulse was 130 per minute. It was what the common people call "inward heat," or fever. A physical examination showed no lung trouble, and no abdominal trouble. It was a case where you could not find a place of disease.

Forty-eight hours later, the child died of suffocative bronchial catarrh. One year ago, I had a child that was taken with an attack of this kind, and the next morning the child died.

In the treatment of this case, reduction of temperature and relieving congestion were the cardinal points. Warm mustard baths, followed by rubbing until the skin assumed a rosy hue, and then placed in blankets, after she was wrapped in a cloth dipped in tepid water and spirits of turpentine. The cloth was wrapped around the child's chest. Aromatic spirits of ammonia, gtt. v, with whiskey, gtt. x, were given every two hours, to stimulate. Water was given in teaspoonful doses. One grain of antipyrine was given, to bring down the temperature. Last evening the temperature began to ascend, and reached 102° F. It showed no prostration at any time. Where you can't say for sure what the trouble is, you should think of this condition of suffocative catarrh. The warm bath is considered by some to be injurious; but we have yet to see any depression in its use in twenty or thirty cases in which it has been used. When any signs of depression come on, abandon its use. In a case of umbilical sepsis, a few tepid baths of this kind caused a cure.—*Davis.*

PUERPERAL PYÆMIA.

This is a patient upon whom I have been waiting with mixed hope and fear. Look at her position as she lies before you. Her color is not bad; the edges of her tongue are red, and the center coated; pulse has a fair degree of volume, and her skin feels normal. Emaciation is not extreme, and she is now convalescing from a long and serious illness. Her trouble began first with the birth of her child, two months ago. She had a normal labor. She never got out of her bed. One week after the birth of her child, she suffered with fever, and when she was brought to the hospital—twenty-two days ago—her temperature was 102° F., and was followed by exacerbations, and at one time reached 104.5°. This is the temperature of septic infection. The course has been to recovery. At first, there was fever at night; no lochia, nor offensive vaginal discharge; uterus well contracted; but there was pain in the back and joints. Her trouble was acute septicæmia, or pyæmia, with tendency to metastasis. It is an acute septicæmia, taken in forty-eight or seventy-two hours, without any ulcer or lesion that can be found on careful examination. It was followed by high and continued fever at times, and at other times the temperature was sub-normal. She has no complaints to make at any time, and is uninterested with anything about her. She tends to sink down in bed, and has a condition of fever which, for a time, was very unfavorable, but at present presents a better prognosis. The pyæmia becomes localized.

The peculiarly interesting feature is, the complication of pain in the back and pelvic joints, which may cause you to think of rheumatism. You find a center of dullness over the lung, that may lead you to pneumonia. In most cases of puerperal women, pain in the joints, and high temperature, indicate pyæmia, and not rheumatism. The other metastasis from which she suffered, was in the lung; but that passed away. The position of the patient is due to an abscess in the popliteal space, on the left side. She also suffered from a bad sore on her back. I never found enlargement, puffiness, or bogginess of the joints; but there is no doubt that such was the case. What treatment has she had?

She has had good nursing, and every device has been used to allay all tendency to uneasiness. Cautious examination for any point where pus or poison could collect was made, it was evacuated and treated antiseptically. Stimulation, and keeping up the spirits of the patient, are the foundation for treatment. Protracted administration of alcohol, in as large doses as several ounces every few hours, without fear of intoxication. Intoxication means eradication of the disease. In a patient who became intoxicated, and whose skin began to secrete moisture, in a condition of this kind, cold was applied to the head, and black coffee was given.

This patient has not been intoxicated with the alcohol, and has taken it with milk and broth since her admission. You may change the alcoholics from whiskey to port wine, or any heavy alcohol. When she is tired of liquors we give her alcohol itself. Quinine, beef and good food. Let her drink buttermilk, or any thing she desires, and in large qantities. Reduction of temperature is better accomplished by applications of cold than antipyretics.

On post-mortem you may find metro-phlebitis around the uterus, and from this thrombi travel into the circulation—preferably to the right side of the heart and into the lungs—hence frequent infection of these organs. Bandaging from the hip toward the knee to drain the abscess and prevent the pus from burrowing. The mortality rate is 90–95 per cent. I have seen a patient live for ten or twelve weeks with the joints enlarged and high temperature, and finally recover. There is danger in this case from cerebral embolism, and this will cause death if it takes place.—*Davis.*

FAVUS.

Here is a child who has the parasite of favus in its scalp. When she first came in she was infected with pediculi. Her hair was cut short and head cleansed. Make a steady and persistent application by wearing a scull cap lined with some soft material, on which you can smear any antiseptic emollient that you want to use. The crusts are not very large, and are not large enough to be produced by scratching or burrowing parasites. Have a yellowish umbilicated appearance, and pecular smell. It is a case of favus. Carbolic acid, creoline or thymol mixed with any emollient, such as tallow, makes a good application.

Make a skull cap of oiled silk, or rubber, that covers the whole portion of the scalp covered by hair; cover the inside of the cap with cheese cloth; smear

it inside with the application ; place on the head and allow it to remain there. Carbolic acid is the best application. In eczema capitis, or crusta lactea, the skull cap, with oil or unguent, is sufficient to remove the crusts and scales.—*Davis.*

RASH FROM ANILINE DYE.

Not long ago, a large and well-developed child was brought, with a temperature of 102–103°; presented a reddish blush, which looked like the eruption of some fever. The baby's complexion is blond, and it will get up a skin irritation very easily. There are a few, faint, reddish blotches on its back. The case was pronounced one of scarlatina. Examination showed that the child had worn a red-flannel jacket, and a red ribbon around its neck, and this was the cause of the so-called scarlet fever rash, for the red color had stained the skin. The fever came from a slight tonsillitis, which soon gave way to treatment in forty-eight hours. Here is a practical lesson not to jump at hasty diagnoses before you have made a thorough examination of the case. Too frequently does this happen, both to the detriment of the physician as well as his patient.—*Davis.*

MEDICO-CHIRURGICAL HOSPITAL.

SULPHO-CALCINE IN DIPHTHERIA.

A CASE of diphtheria came into my hands recently, which had been resigned as past hope by the former physician. The event fully justified his opinion. This case presented a difficulty, sometimes met with, where the preparation of iron and nascent chlorine, upon which I usually rely, proved too strong for the child's mucous membranes ; while it could not destroy the diphtheria when diluted. The day before the child died, her brother, eighteen months of age, was seized with the same disease, in a malignant form. Knowing that it would be useless to rely on the chlorine mixture, a trial having shown the same effect as in the older child, I determined to employ sulpho-calcine ; Dr. Love having reported favorably upon it. The liquid was applied in full strength to the false membranes, while the mouth, throat and nose (which began to discharge ominously) were washed out hourly with as strong dilutions as they could bear. The child recovered, although slight epistaxis occurred, showing how grave was the nasal affection. This remedy deserves a further trial.—*Waugh.*

SPRING SCURVY.

To a certain extent the children of the poor are at this season of the year in a scorbutic state. While fruits and vegetables are really within the reach of all our city residents at reasonable prices the year round, yet the slight increase in cost during the winter is certain to greatly lessen their consumption. In all cases of catarrhs, gastro-intestinal and like affections occurring now, it is well to order a full supply of the acidulous fruits and vegetables ; pickles, oranges, shaddocks, fresh onions, spinach, etc.

—*Waugh.*

PENNSYLVANIA HOSPITAL.

SUPPURATING SINUSES.

ALL suppurating sinuses, which are not healing, should be slit open, cicatricial tissues removed and curetted, packed with iodoform gauze, and allowed to heal by granulation. This applies to the treatment of fistula in ano.—*Deaver.*

HEMORRHOIDS.

Actual cautery is the best of all operations for the cure of hemorrhoids. Dilate the sphincter ani with the thumbs or fingers ; isolate the hemorrhoid ; clamp the base with clamp forceps ; snip off the top with a pair of scissors, and leave a good base. Sear the base with an iron at a dull, red heat (not a white heat, for it is destructive ; cuts through and don't cause coagulation). Release the clamp and not a drop of blood flows. Rest in bed for a few days.

—*Deaver.*

SULPHONAL.—Gordon (*British Medical Journal*) sums up a carefully prepared paper upon sulphonal, as follows :

1. It reduced the excitability of the reflex function of the spinal cord.
2. It diminished peripheral sensation.
3. Clinical observations showed that large doses slowed respiratory acts.
4. It did not affect the pulse rate.
5. That it slowly destroyed the conductivity of motor nerves, and that subsequent washings with salt solution tended to restore it.
6. Saturated solutions slowly diminished irritability of muscle, but sebsequent washings with salt solution tended to restore the irritability.
7. That small doses, five to ten grains, increased excretion of urea.
8. That large doses diminished excretion of urea.
9. That under the influence of the drug the excretion of phosphates was diminished.
10. That it had no marked influence on the excretion of the fluid constituents of the urine.
11. That in none of these experiments was any cutaneous eruption observed.
12. There was no flushing or perspiration markedly observed.
13. That its influence on temperature was negative.
14. That it occasionally caused vomiting, but there was no marked loss of appetite.
15. That diarrhœa was noticed occasionally.
16. That in good health a hypnotic effect was distinctly produced.
17. That in cases of insomnia it was reliable.
18. That the sleep which followed its administration was generally tranquil and refreshing.
19. That sometimes the patient woke with a feeling of confusion.
20. That inco ordination of the upper extremities occurred occasionally.
21. That inco-ordination of the lower extremities occurred occasionally.
22. That a feeling of depression occasionally supervened.
23. That giddiness was observed.

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WILLIAM F. WAUGH, A.M., M.D., Managing Editor.

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LIFE INSURANCE WITHOUT EXAMINATION.

AN English Life Insurance Company proposes to do away with its medical examination. The reasons given are that the mere fact of being required to undergo this investigation is sufficient to deter many persons from insuring themselves, and that the examination is really not worth its cost to the company, as it rarely detects such disease as will cause the applicant's death within a short time.

There are some lessons to be gathered from this singularly naïve avowal. The first is, that the primary object of the company is to insure; the security of its clients' interests being a secondary object. Every improper subject who is admitted to the company's list of liabilities, lessens the value of every other policy issued by that company; increasing the net cost of insurance, and decreasing that stability which is the first essential in life insurance. The only tangible reason for any man being unwilling to be examined is his consciousness of his unfitness. The company which does away with the examination is pretty certain to be saddled with this whole class of men, conscious of their unfitness to pass muster. That any really sound man would join a company with such a burden to carry does not seem probable.

The second reason given needs but little comment. Deaths within a few years, or even months, after an examination, may occur, and there is no possibility of their being foreseen. Habits change; pathological processes spring up and run their course to a fatal ending; tendencies towards disease are awakened by fortuitous circumstances; noxious agents of external origin find their way into the body, and it is preposterous to suppose that any medical skill could foresee such occurrences. It would be a vast improvement if the companies were to demand a re-examination every year, that such tendencies towards disease could be detected early enough to prevent serious consequences; and the expense of such investigations would be a remunerative investment to both insurer and insured.

It is quite likely that in some cases the examinations are not as thoroughly performed as they should be; but this is not a reason for doing away with them. In too many instances examiners are chosen for their personal or social influence, instead of their professional skill. The favorite individual for such positions seems to be the man of good family, who has studied medicine because he must have some ostensible occupation, but is not disposed to do the hard work of his calling. He prefers to sit a few hours in the company's office, get an occasional fee, and then amuse himself for the balance of the day. If the companies were willing to pay a fair fee, they could secure the services of the men to whom medicine is their life-work; whose great experience enables them to see at a glance things which are beyond the comprehension of the dilettante physician.

The most remarkable part of this London company's proposition is the method of compensating for the absence of an examination. It is, that if the insured die within five years, his heirs shall not receive the amount of his insurance, but only the amount he has paid in premiums, with interest. In other words, he is to pay for insurance for five years without being insured!

We cannot believe that this scheme will find favor in insurance circles.

THE DISPENSARY ABUSE.

IN a paper read before the Liverpool Medical Institution, Dr. Rentoul contributed some data of interest here, as well as in England. With a population of about 600,000, Liverpool charitable institutions report 277,311 persons receiving treatment. Adding the suburban population, presumably drawn upon, and deducting 67,047 for duplications, he finds that 10 out of every 38 inhabitants received free medical relief. As it is quite unlikely that all the inhabitants of Liverpool were ill during the year, it is fair to assume that the 277,311 persons treated represented at least as many more of their own families who needed no treatment. The wonder deepens as to how the medical profession earns a living when more than one-half the population pays nothing to its support.

Will Mr. Bellamy please hurry up his little reconstruction scheme?

Dr. Rentoul states that the following plans have been tried, and failed:

1. Payment of entrance-fee, of one penny to one shilling.

2. Payment of prescription-fee, of one penny each.

3 Presentation of recommendation-tickets to subscribers. St. George's Hospital reports that, as a result of this plan, there were admitted 7 housekeepers, 16 ladies' maids, 56 cooks, 29 butlers, 37 grooms, 16 footmen, 72 coachmen and 53 general servants.

4. Admitting a limited number each day.

5. Priority tickets: treating first those who pay most.

6. Closing the doors at a certain time.
7. Opening the doors in the evening only.
8. Charging wage-earners a penny a week.

In all the above cases failure resulted, because the charity was sold.

The remedy suggested is the establishment of a wage limit; no relief being given except to those whose weekly wages fall below a certain specified amount. At the Manchester Royal Infirmary, the plan carried out since 1875 is as follows: The wage limit is placed at 12*s.* weekly for a single adult; 18*s.* for man and wife; 1*s.* 6*d.* for each child.

Annotations.

IMPROVE THE CORSET.

ONE of the most common complaints of womankind is that of pains in the lower part of the chest. This region of the body is liable to suffer pain from a variety of causes, but by far the most frequent is myalgia of the intercostal muscles. This may usually be attributed to the wearing of corsets. By these, the ribs are fixed, and through the waking hours the muscles are rendered motionless. The result is granular degeneration of their tissues; and when the weakened fibres are called upon for exertion, pain of the myalgic type ensues. This problem appears to be too deep for the feminine mind, which cannot comprehend why the lack of motion should give rise to a pain which the prevention of motion relieves. Just so the drunkard will never believe that it is the whiskey which destroys his appetite, when whiskey is the only thing which gives him any appetite; and the opium eater fails to see how his drug causes insomnia when he cannot sleep without it. None are so blind as those who do not wish to see.

However, as is often the case, we must try to relieve what we cannot cure; and as woman has clung to her corset, in spite of the unanimous condemnation of the physicians for centuries, we may try to obviate the difficulty by improving the corset. Some years ago, we noted the singularly elegant shape of a patient, who, as we thought at first, wore no corset. In this we were mistaken, as she had one of a peculiar make. The stays were laced with an elastic cord, while up each side was a band of elastic webbing some three inches wide. This allowed an expansion of the whole chest on inspiration, similar to that seen when no corsets are worn. In fact, the flexibility of the whole thorax was notable. At the same time, every object of the corset, as regards the preservation of the figure dictated by the prevalent taste, was obtained by the use of this corset. So little did it interfere with the lady's health that a retroversion of the uterus was successfully treated while this corset was worn. The name of this particular make is not material, as we know no reason to prevent any corset being fitted with elastic cords and having a band of elastic webbing run in at the sides. This should extend across the whole width of the corset, from the axilla to the waist, and can be made wider at the top if desired. Any manufacturer of elastic stockings, etc., would be able to make this alteration in the corset preferred by each individual. We are not aware that this corset is protected by patents, and make this suggestion only if it does not conflict with the patent law.

NEW FORM OF FRAUD.

A PARIS barber has discovered a new road to wealth. He runs his comb through the customer's hair, and shows the astonished dupe a number of nits. The barber, however, assures him that he can easily remedy the little accident by an application of pilocarpus; which he does forthwith; charging as much as he thinks the customer will pay.

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6. Closing the doors at a certain time.
7. Opening the doors in the evening only.
8. Charging wage-earners a penny a week.

In all the above cases failure resulted, because the charity was sold.

The remedy suggested is the establishment of a wage limit; no relief being given except to those whose weekly wages fall below a certain specified amount. At the Manchester Royal Infirmary, the plan carried out since 1875 is as follows: The wage limit is placed at 12*s.* weekly for a single adult; 18*s.* for man and wife; 1*s.* 6*d.* for each child.

Annotations.

IMPROVE THE CORSET.

ONE of the most common complaints of womankind is that of pains in the lower part of the chest. This region of the body is liable to suffer pain from a variety of causes, but by far the most frequent is myalgia of the intercostal muscles. This may usually be attributed to the wearing of corsets. By these, the ribs are fixed, and through the waking hours the muscles are rendered motionless. The result is granular degeneration of their tissues; and when the weakened fibres are called upon for exertion, pain of the myalgic type ensues. This problem appears to be too deep for the feminine mind, which cannot comprehend why the lack of motion should give rise to a pain which the prevention of motion relieves. Just so the drunkard will never believe that it is the whiskey which destroys his appetite, when whiskey is the only thing which gives him any appetite; and the opium eater fails to see how his drug causes insomnia when he cannot sleep without it. None are so blind as those who do not wish to see.

However, as is often the case, we must try to relieve what we cannot cure; and as woman has clung to her corset, in spite of the unanimous condemnation of the physicians for centuries, we may try to obviate the difficulty by improving the corset. Some years ago, we noted the singularly elegant shape of a patient, who, as we thought at first, wore no corset. In this we were mistaken, as she had one of a peculiar make. The stays were laced with an elastic cord, while up each side was a band of elastic webbing some three inches wide. This allowed an expansion of the whole chest on inspiration, similar to that seen when no corsets are worn. In fact, the flexibility of the whole thorax was notable. At the same time, every object of the corset, as regards the preservation of the figure dictated by the prevalent taste, was obtained by the use of this corset. So little did it interfere with the lady's health that a retroversion of the uterus was successfully treated while this corset was worn. The name of this particular make is not material, as we know no reason to prevent any corset being fitted with elastic cords and having a band of elastic webbing run in at the sides. This should extend across the whole width of the corset, from the axilla to the waist, and can be made wider at the top if desired. Any manufacturer of elastic stockings, etc., would be able to make this alteration in the corset preferred by each individual. We are not aware that this corset is protected by patents, and make this suggestion only if it does not conflict with the patent law.

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documents are scattered over the whole land, in the hands of the survivors of the civil war of 1861–1865, which will form material for correct delineations of the medical history of the corps which played so important a part in the great historic drama.

Death is daily thinning our ranks, whilst time is laying its heavy hand upon the heads of those whose hair is already whitening with the advance of years and the burden of care.

No delay, fellow-comrades, should be suffered in the collection and preservation of these precious documents. This task of collection of all documents, cases, facts relating to the medical history of the Confederate Army, invites the immediate attention and co-operation of his honored comrades and compatriots throughout the South.

JOSEPH JONES, M.D.,
Surgeon-General United Confederate Veterans.
Surgeon General's Office of the United
Confederate Veterans,
156 Washington Avenue, New Orleans, La.

Pamphlets.

A Study of Aneurism of the Pulmonary Artery. With the Report of a Case. By Charles B. Williams, M.D.

Anomalies of the Ocular Muscles. Third Paper. By George T. Stevens, M.D. Notwithstanding the fact that the Commission lately appointed in New York reported rather unfavorably on Dr. Stevens' claims, with regard to the effect of muscle strain in the production of epilepsy, his investigations have nevertheless been productive of much good, and evidence a man of excellent ability. This paper relates principally to exophoria. With regard to the symptoms caused by this trouble and by esophoria, he says that whilst the latter is more often the cause of pains in the head, in the back of the neck, and at a point between the shoulder blades, exophoria is more frequently the cause of asthenopia.

Inflammation of the Vermiform Appendix, its Results, Diagnosis, and Treatment. By Thos. G. Morton, M.D., Philadelphia. In this brochure the author presents histories of seven cases, of which five recovered after operation, and two died. These latter, however, were *in extremis* at the time of operation. Dr. Morton insists strongly on an early operation in these cases, and we fully agree with him; for the diagnosis having once been made of the presence of pus in the abdominal cavity, the only rational act is to remove the fo eign substance. Even where pus is only suspected, the patient's chances are better by the operative method than by the expectant.

An Open Letter to G. Alder Blumer, Esq., M.D., Concerning a Thorough System of Ward Supervisorship at the Norristown Hospital. By Robert H. Chase, M.D. Dr. Blumer, in the *American Journal of Insanity*, makes some highly exciting exclamatory periods with regard to a system of mirrors introduced in the Norristown hospital, for the better observation of the attendants, tearfully regretting that we must have the methods of a Russian prison in an American hospital. Dr. Chase, in this letter, handles Dr. Blumer "without gloves," as it were, and seems to us to have much the better side of the argument, though, of course, more cannonades may be expected.

THE way in which the Philadelphia physicians forgot their local jealousies and rallied to the support of Dr. Shimwell, when he was attacked for vivisection, leads us to regret that the affair was settled so quickly. A good, hard fight with some outside element would do much to further the unity of the profession.

The Medical Digest.

SIR HENRY THOMPSON gives an analysis of 964 operations for vesical calculi—17 on children, 14 on women, and the rest on men. The great advantages of litholapaxy were shown by the mortality—in 325 cases being hardly more than half that recorded after crushing at several sittings in 475 cases. The average age was sixty-two and a half years. He insisted upon early discovery and removal. Of the 933 adult cases, lithotrity was done in 800, perineal lithotomy in 115, and suprapubic lithotomy in 18.

—*Medical Press.*

RUSSIAN NOTES.

Translated by C. D. SPIVAK, M.D.

PROF. YANSON read a paper before the Society of Guardians of the People's Health, held in January. In 52 per cent. of the earth's inhabitants (766,000,000), to every 1,000 females there are 1,015.4 males. In Europe, the female population is preponderating. In 99 per cent. of inhabitants in Europe, to every 1,000 males there are 1,021 females. According to governments, the following table was presented:

Britain and Ireland,	to 1,000	males,	1,042	females.
Denmark,	"	"	1,058	"
Norway,	"	"	1,061	"
Sweden,	"	"	1,059	"
Holland,	"	"	1,023	"
Belgium,	"	"	1,002	"
France,	"	"	1,007	"
Switzerland,	"	"	1,041	"
Germany,	"	"	1,043	"
Austria,	"	"	1,046	"
Hungary,	"	"	1,018	"
Portugal,	"	"	1,091	"
Spain,	"	"	1,045	"
European Russia,	"	"	1,045	"

In the following countries the male population is preponderating:

Italy,	to 1,000	males there are	1,005	females.
Bosnia and Herzegovina,	"	"	1,117	"
Roumania,	"	"	1,059	"
Bulgaria,	"	"	1,050	"
Roumelia,	"	"	1,050	"
Greece,	"	"	1,108	"

In the other parts of the earth the male population is larger than the female. In 41 per cent. of the population of

Asia,	to 1,000	females there are	1,050	males, including
Siberia,	"	"	1,071	"
Middle Asia,	"	"	1,009	"
Trans-Caucasia,	"	"	1,174	"
Japan,	"	"	1,024	"
Corea,	"	"	1,024	"

In 5 per cent. of the inhabitants of Africa, to 1,000 males there are 1,035 females, with exception of Egypt and the Western Colonies, where the female population is somewhat larger.

In America, Mexico, Central America, Colombia, Chili, Paraguay, and the coast of Greenland, the female population is larger; in the other countries, the male population preponderates. On the average, in 84 per cent. of the population of America, to every 1,000 females there are 1,023 males. In Australia, to every 1,000 males there are 1,082 females.

—*Vratch* No. 2, 1890.

OBSTINATE RETROVERSION.—Many cases of retroflexion of the uterus, even without adhesions, are very tedious in their recovery; the uterus, being strongly flexed, will often bend itself over the posterior or upper part of the best fitting Hodge's pessary. In these cases, if they will not tolerate a Meadows' stem and loop pessary, or Wynn Williams' stem and shield, it is best to accustom the uterus to frequent replacement, daily if possible, and enjoin the patient to lie prone as long as she possibly can.

—Heywood Smith, in *Provincial Med. Jour.*

TYPES IN DISEASE.—Not only have the most well-defined diseases marked gradations to other diseases, but the main base of many different diseases must be of one great pathological type. Where shall we limit the involvements of indigestion? What is the form of phthisis? What common form is involved in the well-known continuity of indigestion and phthisis?

As we now recognize that in the evolution of the organism, cosmic energies and their correlations must have had an orderly continuity, so we recognize that infinitely delicate changes in the correlations of the energies, and of outer environment to protoplasm and the vital activities, are the occasions for the evolution of disease. We thus feel the force of Herschel's philosophy as applied to disease, "that there is scarcely any natural phenomenon which can be fully and completely explained in all its circumstances, without a union of several, perhaps of all, the sciences."—Pearse, *Provincial Med. Jour.*

SODIUM CREOSOTINATE, introduced as a febricide and condemned on account of want of uniformity in action, has again been studied by Loesch; who finds it a mixture of three isomeric bodies. Of these, paracresotinic acid promises to be of value. It crystallizes from aqueous solutions in long, lustrous needles. It is colored violet by ferric chloride. The sodium salt is a crystalline powder, bitter, but not disagreeable. Dissolved in twenty-four parts hot water, it does not crystallize out on cooling.

Large doses are well borne; part passing through the system unchanged. Loesch took three to four grammes without result other than perspiration. In thirty-two children it proved an active antipyretic. To a child of twelve years, fifteen grains were given within three hours, and the effect noted in two to four hours. The defervescence reached 1.5° C. Especially good results were obtained in gastro-intestinal catarrh of young children. The formula employed was:

R.—Sodii paracreosotin	gr. ij to iv.
Tinct. opii	gtt. ij " iv.
Sp. vini Gallici	m xx.
Syr. acaciæ	ʒj.
Aq. destillatæ	ʒvj.

M.—S. ʒj every two hours.

As compared with sodium salicylate, the new salt is safer and produces no congestive symptoms or digestive disturbances.—*Provincial Med. Jour.*

SALICYLATE of soda has been successfully given per rectum, when the stomach would not retain it.

Medical News and Miscellany

LINCOLNSHIRE has a plague of rats.

THE Paris Faculty of Medicine, during 1889, "referred" 14 per cent. of its candidates.

MEDICAL INSPECTOR TAYLOR advises that coffins shall be cremated with their contents.

LEPROSY is spreading in New Caledonia, where, out of 40,000 Kanakas, 5,000 are lepers.

THE U. S. Consul at Canton states that Chinese lepers have been sent to America as prostitutes.

MISS E. C. STONE has been registered as the first medical woman admitted to practise in Australia.

DR. HENRY H. SMITH, Emeritus Professor of Surgery at the University of Pennsylvania, died last week, of pneumonia.

THERE may be more beautiful places than Lake Mohonk, Ulster Co., N. Y., at the Mountain House, but they are hard to find.

DR. A. C. W. BEECHER left Philadelphia, April 16, for a month's trip to Mexico and California, in pursuit of health and recreation.

IN 1856, the Norwegian lepers numbered over 3,000; but the opening of leper hospitals has diminished their number to about 1,000.

THE O. W. Holmes Hospital, or Sanitarium for Nervous Diseases, at Hudson, Wisconsin, reports 251 patients treated during 1889, with two deaths.

THE Union Credit Co., 1326 Chestnut St., furnishes reports to physicians and others as to the custom of their patients in the matter of paying bills, etc.

MRS. A. M. FAHNESTOCK bequeathed $3,000 each to the American Sunday School Union and the Union Benevolent Association, and $5,000 to the Presbyterian Hospital.

A COMPETITIVE examination will be held for Assistant Physician at Nursery and Child's Hospital (Country Branch), West Brighton, Staten Island, May 15, 11 A. M. Salary, $500.

MERCK'S *Bulletin* speaks very highly of Merck's pure bromide of ethyl as an anesthetic for brief operations. It is not so depressing as chloroform and more manageable than ether.

NOT to be behind hand in the matter of investigation, the *Daily News* has opened a hot fire upon the Working Home for Blind Men. The mortality cannot be estimated until the smoke clears away.

THE following American physicians have been selected to make addresses at the Berlin Congress: Drs. Kidd, A. N. Smith, A. Jacobi, Loomis, and Cutter, New York; Osler and Finlay, Baltimore, and Kimmal, Ohio.

MR. RICHARD CADBURY, of cocoa fame, has offered his residence, twenty acres of land, and $150,000, for use as a sanatorium for women and children. The rules provide that no stimulants shall be used except by doctors' orders.

THE Earl of Meath has called Parliament's attention to the lack of ambulance service in London. The *Hospital Gazette* thinks a comparison with the admirable system in American cities, is "calculated to make Englishmen blush."

A NEW HAVEN couple is said to have been separated by climatic mandate; the husband being compelled to reside in the elevated region of Colorado, for his lungs' sake, while his wife's cardiac affection compels her to seek the sea-coast.

MEDICAL authorities in Vienna pronounce "la nona" merely a new name for the comatose state into which convalescents from influenza are likely to fall, if deficient in recuperative power. But, then, Vienna is nothing if not skeptical.

GUY'S HOSPITAL has opened what the *Hospital Gazette* pronounces the finest and most complete college for the medical students in London. It includes a dining-hall, reading rooms, gymnasium, and sleeping accommodations for fifty resident students.

UNDER the direction of Dr. Jules Rouvier, Professor of the Medical Faculty at Beyrout, a new Index Medicus is to appear, known as the *Revue Internationale de Bibliographie Médicale, Pharmaceutique et Vétérinaire*. Subscription, 10 francs per annum.

IN the Medical Society of London, Mr. Ballance describes four cases in which cerebral symptoms following chronic otorrhœa were held to indicate thrombosis of the lateral sinus. Operations were performed in all, and in two of the cases with complete success.

IF our memory serves us aright, there was once an advertising person named Sherman, who claimed to cure hernias, in this city. He seems to have located in London, where we read of a servant girl compelling him to return the money paid him under a guarantee of cure.

HARRY COSTERS, who fell from the top of a church steeple, on June 13, 1889, is now an attraction at a Philadelphia dime museum. He sustained injuries necessitating the amputation of the right arm and leg, and his recovery is justly regarded as a credit to the German Hospital.

DR. GARRETSON has resigned the chair of Oral and Clinical Surgery in the Medico-Chirurgical College, and accepted the title of Emeritus. He is busily engaged in preparing the new edition of his work on "Oral Surgery," which has grown to a book of 1,300 pages.

THE Academy of Medicine (England) announces as the subject for its prize essay for 1891, the best forms of artificial nourishment for new-born infants, merits and defects of unboiled milk, boiled milk and tepid milk. Essays should be sent in before March 1, 1891. The prize amounts to $400.

THE Annual Meeting of the Mutual Aid Association of the Philadelphia County Medical Society, will be held on May 5, at 8 P. M., at 1400 Pine street. The Association paid out $175 last year to a widow and three daughters of physicians; and added $135 to its invested funds, which now amount to $5,991.50.

THE methods by which English doctors seek to evade the law forbidding advertising would be amusing, if it did not excite pity that our honored profession should be reduced to such expedients. A district medical officer has been stamping on prescriptions furnished to paupers his name, address, and office hours for private patients.

DURING March, St. Louis reported 675 deaths; an annual rate of 18 per 1,000 on an estimated population of 450,000. The principal causes were:

Phthisis	75
Pneumonia	70
Bronchitis	52
Convulsions	43
Old age	35
Meningitis	21
Bright's Disease	21

THE English journals discuss Weismann's experiments in de-tailing nine hundred mice to test the transmissibility of mutilations, with a good deal of levity. So far as heard from, everyone of our English exchanges seems to have been seized with the same idea: that if there were any truth in such transmission, her aristocracy would be headless as well as brainless.

DR. HUGHES has had the surgical instruments at the Philadelphia Hospital put in good order; and made such regulations as will insure their being kept in proper condition hereafter. Besides the danger resulting from the use of dirty instruments, there is much needless pain inflicted by trying to cut with dull knives. The care of the surgeon's apparatus should be one of the lessons taught the young men who enter the hospitals as residents.

THE CITY'S HEALTH.—During the week ending April 12, the principal causes of death were as follows:

Phthisis	62
Pneumonia	50
Heart disease	23
Croup	18
Inflammation of stomach and bowels	15
Convulsions	14
Cancer	12
Typhoid fever	12
Inflammation of brain	12
Old age	12
Bronchitis	11
Microbic diseases	173
Constitutional "	59
Circulatory "	31
Respiratory "	150
Digestive "	43
Genito-urinary "	11
Nervous "	55

The total number of deaths was four hundred and six—fifteen less than for the corresponding week in 1889, and sixteen more than for the week just preceding. It is probable that the influenza has left behind it a marked susceptibility to catarrhal affections, in consequence of which there have been several visitations of an apparent recurrence of that epidemic, but which are possibly due to ordinary causes. During the present week, in spite of unseasonably warm weather, there has been a general prevalence of catarrh, of severe type, with burning of the eyes, headache, etc., but not the depression of the real influenza.

THE Managers of the Seaside House for Invalid Women, invite attention to the advantages offered by the Mercer Memorial House, Atlantic City, to sick or over-worked women, who need, and yet can ill-afford, a sojourn at the seashore.

The charge for a private room, with nursing, medicines, and medical attendance, is $4.00 per week, about one-half its actual cost. Circulars can be obtained by writing to the institution. No one is admitted without previous application.

A RURAL member of the Manitoba Legislature has brought in a bill which provides certain fees which, "and no other additional fees, may be charged and recovered by medical practitioners." This worthy law-maker rates his doctors at $5, for consultation; 60 cents per visit, involving travel over two miles one way; midwifery, $10 to $20; ordinary surgical operations, $3 to $10.

This is certainly refreshing. If there is a doctor in the legislature, he should bring in a bill prescribing the market price on cabbages.

A WELL-KNOWN dentist tried hard to collect a bill, but, after many ineffectual efforts, said to the debtor: "I do not intend to send you any more bills, and I don't intend to sue you; but there is one thing I want to tell you. Every time you cut off a piece of beefsteak and pass it to your wife, I want you to remember that she is not chewing that beef with her teeth, nor with your teeth, but with my teeth." In two or three days he received a check. The notion of those doubly false teeth in his wife's mouth was too much for the husband.—*Christian Advocate.*

NOTE.—We are in receipt of several letters concerning the Medical Congress in Berlin, and the best method of making up a party to attend it. The Congress meets on August 5, and lasts till the 9th. Few care to go so far and incur such expense without seeing more of Europe than the German capital. There are some pleasant trips laid out by Cook; but they do not suit every one. If any of our readers would like to join a party of physicians now contemplated, we will be pleased to hear from them. State number of party, routes or lines preferred, objects sought, and places to be visited; with time at disposal. With these data we may be able to elaborate a trip-schedule which will meet the views of a sufficient number.

DRS. ALLEYNE AND JOHNSON have resigned their chairs in the St. Louis Medical College. Dr. Mudd has been elected Dean.

Drs. Furney, Frankhouser, Gamble, and Chancellor have resigned from the Beaumont College.

Drs. Bond, Carpenter, Love, Lemen, French, Barck, and Summa have resigned from the College of Physicians and Surgeons.

Before these announcements have the effect of inaugurating a pilgrimage to St. Louis on the part of the numerous aspirants to professional honors in the Eastern cities, it may be well to add that the cause of the last-named group of withdrawals is said (*Weekly Med. Review*) to be a rule by which the professors are re-elected annually, and subject to the will of the Executive Committee.

DR. JOHN A. LANIGAN, of Hyde Park, Mass., has found time from his professional work to attempt a solution of one of the great mathematical problems which have baffled geometricians from Euclid to the present day—the trisection of the angle.

How many busy practitioners have visions of the work they will do when they have time! When the winter term closes, and the student betakes himself to bucolic pursuits for the summer; when the present press of work has eased up, and the arrears of postponable jobs—surgical, etc.—are done; a few diagnostic conundrums solved; a little neglected financial snarl untangled, then we will take time to renew our acquaintance with the wife, will look over the children's studies and find out how they chance to be developing their intellects; will write that monograph which has been waiting till we can look up the literature of the subject; will make our will, insure our furniture, cultivate our muscle, reduce our growing weight, take a practical course on bacteriology, look into the Buddhist system more closely, read the recent work on the mound-builders, and Brinton's philological papers on Central America, study up the modern electric marvels, take a pedestrian trip to the Valley of Virginia, make a few social calls on long-neglected friends, etc. We wonder if liberty ever looks as attractive to the cart-horse as it does to the practicing physician. Liberty to do what his soul loves; liberty to take time to follow the alluring paths which invite his steps in every direction. In a little string of rhymes in one of the dailies, lately, was described a party of children who made their wishes for whatever they most desired. The mother's wish was for "the cat's spare time." We envy Dr. Lanigan that he has had time to devote himself to such a labor of love as the solving of a mathematical problem. We hope he has succeeded, but we haven't time to go through his demonstration.

To Contributors and Correspondents.

ALL articles to be published under the head of original matter must be contributed to this journal alone, to insure their acceptance; each article must be accompanied by a note stating the conditions under which the author desires its insertion, and whether he wishes any reprints of the same.

Letters and communications, whether intended for publication or not, must contain the writer's name and address, not necessarily for publication, however. Letters asking for information will be answered privately or through the columns of the journal, according to their nature and the wish of the writers.

The secretaries of the various medical societies will confer a favor by sending us the dates of meetings, orders of exercises, and other matters of special interest connected therewith. Notifications, news, clippings, and marked newspaper items, relating to medical matters, personal, scientific, or public, will be thankfully received and published as space allows.

Address all communications to 1725 Arch Street.

Army, Navy & Marine Hospital Service.

Changes in the Medical Corps of the U. S. Navy for the two weeks ending April 12, 1890.

WHITE, S. S., Assistant-Surgeon. Detached from the U. S. S. "Minnesota," and wait orders.

HARRIS, H. N. T., Assistant-Surgeon. Ordered to the U. S. S. "Minnesota."

Medical Index.

A weekly list of the more important and practical articles appearing in the contemporary foreign and domestic medical journals.

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Epithelioma of the penis, Rose. Med. Press, March 26, '90.
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